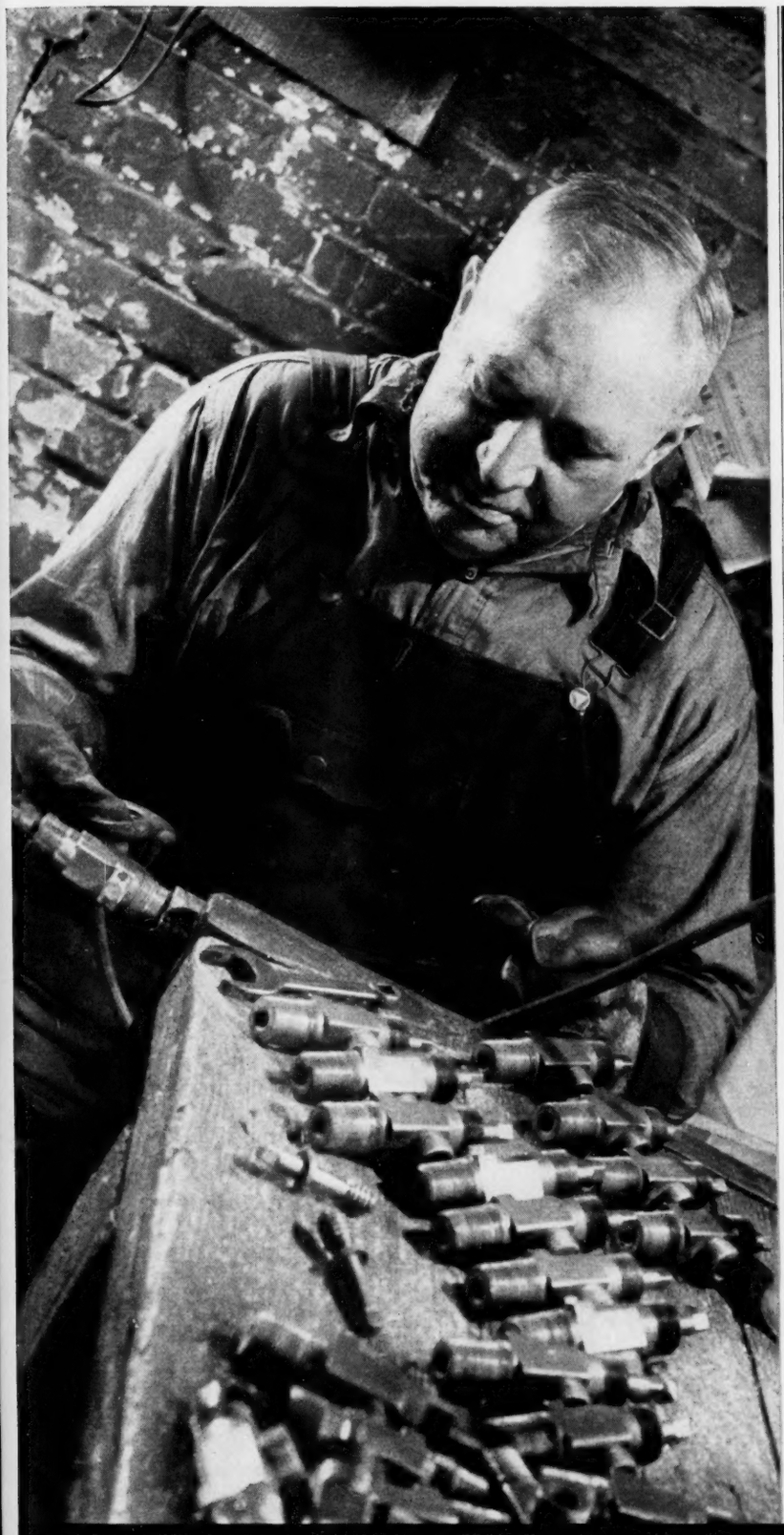
ADVERTISING PAGES REMOVED



VALVES *be Seated!*

•

To good-natured Charlie Elstrodt, every chlorine cylinder valve is leaky until his own "personal" test proves it is tight. Because of Charlie's hard-boiled philosophy, because of the sureness of the compressed air test, mighty few leaky valve seats have gotten by Charlie's inspection in his sixteen years at Mathieson's Niagara Falls plant.

Charlie's job is one of about nineteen different steps in the cleaning, reconditioning and inspection routine through which Mathieson Chlorine cylinders and valves must pass before they are shipped. And in each of these operations it is men like Charlie Elstrodt, men who keep their eyes "glued on the ball", who give Mathieson's cylinder routine the backbone which makes it valuable to you.

Mathieson engineers produce chlorine of a purity second to none; and Mathieson workmen see that you get this pure product in clean, smooth-functioning containers. Couple with this Mathieson's unusual traffic and delivery facilities and their expert technical service and you see why this company presents a chlorine team that is hard to beat.

The MATHIESON ALKALI WORKS (Inc.)
60 East 42nd Street New York, N. Y.

MATHIESON CHEMICALS

SODA ASH . . . CAUSTIC SODA . . . BICARBONATE OF SODA . . . LIQUID CHLORINE . . . BLEACHING POWDER
HTH AND HTH-15 . . . AMMONIA, ANHYDROUS AND AQUA . . . PH-PLUS (FUSED ALKALI) . . . SULPHUR CHLORIDE
CCH (INDUSTRIAL HYPOCHLORITE) . . . DRY ICE (CARBON DIOXIDE ICE) . . . ANALYTICAL SODIUM CHLORITE

The Reader Writes:—

Suggests Situations Wanted Column

Mr. Baker of Norfolk, Va., in the September issue seems to have devised a new method for recent grads to get located in the chemical field. I regret very much that he did not use the Situations Wanted Column, because I think he would have obtained better results.

He wants a job at anything from border to border and coast to coast, but so do technical graduates who have experience far in excess of Mr. Baker.

If the grads start using this column to find jobs, I'm sure that more important letters will be delayed in reaching the public. Then again the Readers column will reach the proportions of the *Encyclopedia Britannica.*

Stop bragging, Mr. Baker, about your sacrifice to the Altar of Chemistry. If you're good, there is no doubt that Chemicals will discover you. You have plenty of hard knocks coming.

Flushing, N. Y. FRANCIS X. MCMAHON

Propaganda Instead of a Science

I have read the editorial on "Chemicalization." I have felt in recent years that there was some danger that chemistry might become a method of propaganda instead of a science. There is probably as much basis for emphasis on the physicalization of industry as on the chemicalization of industry, and I do not know where the line should be drawn between chemistry and physics any more than a line can be drawn between pure and applied science.

It seems to me that we would make more progress if chemistry looked upon itself as the servant rather than as the principal to which others owe allegiance.

Providence, R. I. HENRY M. WRISTON,
Brown University

What is a Chemical Company?

There are many chemical operations employed by the process industries and chemical control also exists. But, by the application of the usual meaning of the word, these companies are not in the chemical business even though they may be regarded as having chemicalized their operations. It is true, they employ trained chemists, but they do not manufacture or synthesize chemicals as raw material for the industries who process them.

I think therein lies the definition of a chemical manufacturer, in the sense that the word is usually used; namely, he manufactures chemicals from basic raw materials and sells these chemicals to the process industries who utilize them in the manufacture of the finished product.

By the "process method" chemicalization may or may not exist, depending upon the type of finished product that goes to the ultimate consumer.

St. Louis, Mo. G. LEE CAMP,
Vice President, Monsanto Chemical Co.

No Sharp, Defining Lines

"The chemical bailiwick" cannot be bounded by sharp lines definitely including one industry and definitely excluding another. Nor do economic and technical boundaries coincide. For example, the textile industry is not (economically) a chemical industry, but its existence and expansion as any sort of a modern industry depends upon its information and use of items from the strictly "chemical bailiwick," particularly detergents, lubricants and dyes.

'Tis true that "their chemists and chemical engineers are specialists," but so are those in the employ of firms like the Bakelite Corporation and the Dow Chemical group. In other words, "the chemical bailiwick" is a technical empire supported by the general engineering and commercial efforts of all industries profiting by the application of chemical principles.

Personally, I cannot see why we should not "expect 'them' to join our technical societies"—if by "them" you mean the technical employees and corporation memberships of paint, petroleum, glass, textile, etc. Certainly, the American Chemical Society through *Chemical Abstracts,* etc., serves all these industries well, and—even though I understand no part of sections like those on biological and pharmaceutical chemistry—I feel the support of all groups strengthens all groups.

Your correspondent (re paragraph 3 of the editorial) makes me wonder if "chemicalization" wasn't necessary to change certain lines (noticeably glass and paint) from arts to industries. Besides, who cares which is tail and which is kite? Both go up together.

Cleveland, O. L. M. CURRIE

100 Per Cent. in Agreement

It seems to me that in your editorial entitled "Chemicalization," you have analyzed the situation correctly and covered the subject pretty well—particularly in your last paragraph.

Lansdowne, Pa. J. L. BATES,
President, Bates Chemical Co.

Technological Advance

Nothing makes me see red so quickly as the fool notion that the way out of our economic difficulties is to declare a moratorium on research. It is a fallacy greater even than that scarcity is the way to prosperity.

There is available a perfect answer in the paper read at the meeting of American Trade Executives, September 22, in Pittsburgh, by Dr. Ernest B. Benger, assistant chemical director of E. I. du Pont de Nemours & Co. I am sure the company would gladly send a copy of this fine address to anyone, and everyone ought to read it.

Pittsburgh, Pa. WALTER W. WATSON

Specialized Research in the Universities

I was very much interested in your editorial "Research in the Universities" appearing in the September number and the comments on Mr. Chilton's suggestion that each university specialize in some particular branch of the industry in the interest of more concrete results. I must disagree. Of course, much depends upon what you conceive as the primary function of the colleges and universities.

In my opinion the college course, yes even the post-graduate courses, should be primarily one of broad training. Fundamentally the universities should not be the place for profound and specialized research. That is just an idea borrowed from the Germans. Let us train our chemists broadly in the universities and then establish several more Mellon and Battelle Institutes. Oil and water doesn't mix any better than research and instruction do in most of our schools.

Chicago, Ill. D. H. REVERE

CHEMICAL INDUSTRIES

The Chemical Business Magazine

Consulting Editorial Board
R. T. Baldwin, L. W. Bass, F. M. Becket, B. T. Brooks, J. V. N. Dorr, C. R. Downs, W. M. Grosvenor, W. S. Landis, and M. C. Whitaker.

Williams Haynes, Publisher and Editor; A. M. Corbet, and W. J. Murphy, Associate Editors; W. F. George, Advertising Manager; D. O. Haynes, Subscription Manager; J. H. Burt, Production Manager.

The New Management

DAY and night are not more different than the point of view of the modern executive and the traditional attitude of the industrialist of the last generation. This reflects the fundamental changes wrought by the transition from personal ownership of our industrial companies to the stock-ownership of our individual corporations. The individual enterpriser has been replaced by the professional manager.

What this means was revealed at that exceedingly significant International Management Congress in Washington last month, and because many of these changes are unnoticed and most of their effects unappreciated, we have culled generously from the proceedings to give you a clear cross-section of what present-day management thinks about many of the problems that press upon us all.

One notes immediately that, as a class, the "economic royalist" is as dead as the dodo. There are some unregenerate individualists among the executives of all kinds of corporations, and it is not always fair to judge a man's inner thoughts by his public utterances. Nevertheless, the incorrigible independents are much more numerous among the smaller businessmen—a fact that astonished the New Dealers—than among the management of our great, publicly-owned companies. Furthermore, the detached, professional mental attitude of the modern executive and his tacit assumption of responsibilities to his work people, his customers, and his government was so unanimously, often so unconsciously, expressed that its reality and sincerity cannot be questioned.

The corporate organization has its disadvantages and we suffer a real loss in sapping the bold, individualistic spirit of the pioneer. For all his selfish ruthlessness, he blazed industrial trails which our great corporations have built into great highways. The hardy pack-horse is replaced by the powerful motor truck. And the horse-wrangler's successor must be an expert mechanic. The two jobs call for quite different talents, and the leaders of the two epochs of American industry are different men with distinct obligations and divergent objectives. We are inclined to believe that this is the most important change which has taken place in American business since 1900.

Property Rights and Research

Burning down the stable to roast the pig is not a particularly clever procedure although at the moment, in a great many different directions, it seems to be extremely popular. The St. Louis lawyer, Delos G. Haynes, who addressed the American Chemical Society at Milwaukee last month, pointed out some of the dangers of destroying our extremely valuable patent system by attempts to improve and simplify its procedure. He recognized, as many do, that there is need for some changes and there are very few indeed, who will quarrel with the desirability of his positive suggestion that interference practice be much simplified; that the requirement for printed records and briefs be replaced by typewritten papers; that claims be much shortened and made more explicit; that better pay for patent examiners would keep them longer at this important work, and that appeal in the patent courts should be speeded up.

The needs for such "reforms" of the patent law practice are so self apparent that it would be well indeed, if all who are interested in this problem would concentrate upon these four and see if they could not be put into effect. Such changes would certainly not impair the patent structure, nor revolutionize patent practice. The chemical industry knows full well that patents are an extremely vital adjunct to research. Research is, after all, the very core of our technological progress. It certainly is sound sense to concentrate on a few simplifications that would not jeopardize property rights or curtail the research movement.

Chemicals in the Sudeten

In a Europe obsessed with ideas of national self-sufficiency there is plainly no place for those little states which in the old era served as useful diplomatic and military buffers wedged between more powerful nations. Hence a cold-blooded view of the gobbling up of Czechoslovakia would waste little sympathy over the fate of that land and its people; but would appraise the economic resources at stake and weigh which of the larger powers would acquire them.

The Sudeten area is a notably rich prize. Herein lie valuable lignite fields, and lignite is an important raw material in modern European technique. Furthermore, this region was the industrial heart of the old Austro-Hungarian empire. From our chemical point of view, its most important asset is the Aussiger Verein with three great plants at Aussig, at Henschau, and close to the lignite deposits at Falkenov. It produces three-quarters of the entire Czech chemical output—a virtual monopoly in alkalies, mineral acids, carbide, cyanamid, lithopone, dry colors, and significantly in chlorine and synthetic ammonia. The company, moreover, has long held an important European position in activated carbon, tin and zinc salts, and coal-tar dyes; and it controls, or is largely interested in, alkali plants in Poland, Rumania, and Yugoslavia; the Bohemian rayon factory; the Zorka heavy chemical plant in Yugoslavia, and pharmaceutical companies in Yugoslavia and Hungary. These are indeed far-flung and important chemical assets.

The famous Skoda arms factory with an export business of over thirty million dollars a year is outside the Sudeten district. But its Pilsen plant (making artillery and tanks) is just outside. Inside, however, are practically the entire Czech textile, glass, and pottery industries. Totalled, these industrial resources are main props of the Czechoslovakian manufacturing activity.

One may be quite so realistic as to view with utter unconcern the chopping up of the smaller European states. Their present plight is their historic position. Nevertheless nobody in this country can fail to be apprehensive that their economic sinews strengthen the totalitarian states, nor to be deeply concerned at the impotence of peace-seeking diplomacy before an aggressive show of force. Even if considered quite objectively, the problem becomes pressing and the prime question becomes one of how strong England, France, and Russia dare allow Germany and Italy to become.

Incompatible Objectives

Speaking as "one labor leader," Robert J. Watt, American Worker Delegate to the International Labor Office, recently set forth the following ideas—

1. Labor does not want higher wages and shorter hours.

But the Wagner Act and the Wages and Hours Law have his wholehearted support.

2. Labor demands collective bargaining.

But union incorporation is "the child of ignorant scheming."

3. Capital must not write-off labor during curtailed production, any more than they can write-off idle plant and equipment.

Yet he declared that fundamental to all considerations was labor's desire for recognition as a partner of capital in production.

It would be a great help to the solution of our labor problems if our leaders, on both sides, would remember that one cannot eat one's cake and have it too.

The Management Thinks About

Costs
Labor
Demand
Technique
Distribution
Stockholders

In Washington last month, at the 7th International Management Congress, a mirror was held up to the thoughts of the world's industrial leaders. Widely divergent ideas were propounded, and so radical changes were reflected in management's basic conceptions that we present here a vivid summary.

HOW tremendous a revolution has been wrought in the thinking of the men who today manage American industry is dramatically set down in black and white by the creed which Lewis H. Brown, president of the Johns-Manville Corp., proposed as a concrete expression of today's ideals and practical intentions of modern business:

We whose responsibility it is to supply the needs of the public for goods and services and who recognize our obligations to stockholders and employees, believe,

That we should constantly seek to provide better values at lower costs so that more of our people can enjoy more of the world's goods.

That we should strive to develop the efficiency of industry so as to earn a fair return for the investing public and provide the highest possible reward for the productivity of labor.

That we should stimulate the genius of science and utilize the methods of research to improve old products and create new ones so as to consistently provide new fields of employment for the present and coming generations.

That management should encourage fair trade practices in business which, whether effected by competition or cooperation, will be so shaped as to be for the best interests of our customers and of society as a whole.

That it is management's duty to be alert to its own shortcomings, to the need for improvement, and to new requirements of society, while always recognizing the responsibility of its trusteeship.

That business in this country has never been what it could be and never what it yet will be.

That Business, Labor, Government and Agriculture working hand in hand can provide jobs and the opportunity for all to work for security without loss of our liberty and rights as free men.

Mr. Brown amplified his thoughts on management itself and its relations with both labor and government in the following pertinent phases:

Modern managers in reality are scientific specialists. These new industrial executives differ widely from the owner managers who preceded them in the ideas, ethics, social concepts, and methods of management. Management no longer represents, as formerly, a single interest. Increasingly it functions as trustee endeavoring to maintain a proper balance of equity between the shareholders, the jobholders, the customers, and the public.

Controversy and strife between business and labor are birthpains which are completely deceptive of what is really taking place. Confusion and recrimination in the relationships of business and government, on the other hand, characterize the reopening of that old argument—is government the servant or master of men?

A new order of things that is emerging is obscured by dust clouds of words from political demagogues and radical agitators who have sought to extract personal advantage from the existing confusion. Once the commotion subsides, those who have the interests of labor sincerely at heart and those who, no less sincerely, guide the destinies of industry, will be found nearer to fundamental agreement than ever before. This new concept of mutuality of interest, this goal of constructive collaboration, is foremost among the aims of enlightened industrial management. No one minimizes the difficulties that still lie ahead. Many clearly anti-social practices, such as lockouts, sitdown strikes, production sabotage, and gangster methods, and labor racketeering must be eliminated. But if we work sincerely and honestly toward constructive industrial cooperation, that cooperation will in the end be achieved.

Neither business nor government can solve this problem singlehandedly. Yet instead of collaboration and cooperation, particularly in lifting the heavy burden of unemployment, we find uncertainty and confusion, suspicion and recrimination. There are many evidences that government will, in the future, exercise an increasing voice in the conduct of business. Once bureaucratic regulations are established they are seldom, if ever, abandoned. What we must strive for, therefore, is wise and intelligent supervision which aids rather than hampers business. Unless we are entering an era of political exploitation, whereby government is operated by and for the benefit of a vast party machine, rather than for the people and by the people; then government itself should welcome the collaboration of technical experts, trained in business and understanding the problems of business, who can bring to these supervisory posts the vision and skill that is required. Government needs to profit by industry's example and utilize, far more than it has in the past, this new profession of scientific management.

The Italian Ideal

Though the objectives sound similar, a quite different way of attaining them was explained by Gino Olivetti, chairman of the Italian National Committee for the Scientific Management of Labor.

Assistance to workers must become a manifestation of the spirit of collaboration among the various factors of production. It must be considered as a necessity of their national solidarity which, in Italy, is a fundamental principle in the politic of labor. According to these premises the State must necessarily be responsible for its development. Thus the State is the administrator and controller of industrial activity whose burden, proportionally divided amongst those who share in the productive

process, does not weigh on anybody but is a simple and mere duty, similar to the duty of paying taxes to the State for the administration of national services.

And The German

The German point of view, from a somewhat different angle was set forth by George Seebauer, Director, the German Efficiency Board. He explained the Nazi ideals of rationalization as follows:

It is possible to give the following guiding principles applicable both to the economic and the social side of rationalization:

1—It is the task of trade and industry and therefore the aim of economic rationalization work to create the material basis for the maintenance of development of the standard of living and the pursuit of the life aims of the nation.

2—To realize this task, the rationalization movement should be in harmony with the vital interests and the present philosophy of life of the nation. In other words, every economic rationalization must be subject to the existing social, economic and cultural demands of the nation.

3—The community principle must be the pivot upon which the constructive work of the nation turns. Recent experience of constructive work shows that every member of a nation must be accorded the right to acquire through his work a decent standard of living and a share in the social product of his nation. This right must arise out of the duty to render service to the community.

I.C.I. Man Speaks For England

Self-discipline rather than rectitude imposed by law is the English idea of labor relations endorsed by the chief labor officer of the Imperial Chemical Industries, R. Lloyd Roberts:

Compulsion is anathema to the Britisher—whether he be employer or workman—hence we view the use of compulsory powers as a last resort only and we find them effective in direct proportion to what one might describe as the lastness of that resort. We do not legislate in advance of, but rather in support of, public opinion. Apart from our dislike of compulsion, however, our objection to State intervention in industrial relations is based on a principle to which we attach the greatest importance. State intervention in any country is only a nice way of saying political intervention, and we believe it would be highly prejudicial to the national interests if questions of work, wages, etc., were to be caught up in the maelstrom of party politics and settlements were effected in pursuance of some pet political theory instead of in conformity with the ascertained economic facts of the situation.

We like to keep industrial problems to the calm, unimpassioned atmosphere of the business conference room, where they can be subjected to the necessary reasoned analysis and discussion, rather than let them drift on to the political hustings to be the shuttlecock of competing party pledges and passions.

Another Chemical Leader's Views

Another foreign chemical leader, Dr. A. Basch, general manager of the United Chemical and Metallurgical Works of Czechoslovakia, expressed our American chemical industry's own philosophy when he branded as erroneous the idea that higher living standards can be won by restriction of output plus redistribution of income:

This aim can only be reached by an increase of production; and if governmental social policy hinders the activity of enterprise and private initiative, then the direct opposite—a lowered standard of living—is obtained.

The contrast between the economic policy of the so-called dynamic or dictatorial and the democratic systems is quite obvious. In dictatorial states the economy, as well as the population, must be subjected more and more to the authority of the State. There are virtually no real differences between a socialistic economy and the strictly-carried-out economy of a dictatorial regime. The highest aim is always political and domestic, as well as foreign trade, is therefore strictly regulated. Such regulation must always aim at self-sufficiency. In this way the effect of economic laws on the re-establishing of economic equilibrium, as always expressed by the price-laws, is immediately eliminated.

Advice From Sweden

Thoughts of overcoming bad business from "depression-proof Scandinavia" are worth recording. The Stockholm telephone executive, Nils A. Sterner, made this contribution:

Authority and discipline are good driving forces, but in my opinion a better one is the personal economic advantage. A manager, if he were able to elaborate plans which would make it possible to pay every man in accordance with his value to the enterprise, would automatically come a good bit on the way towards a perfect coordination of all efforts.

Industrialists are in the habit of spending much money on sales activities in good times. In bad times their custom is to be very careful, as they call it, in spending money and in allowing credit facilities. The result is that the variation in the production of their own factory becomes more than proportional to the variation in business as a whole. This aggravation of the waves of business activity is, of course, very detrimental to profits. The policy mentioned, however, has one advantage: It makes it easier for other industrialists, following the reverse policy, to get their production variations smaller in proportion to average business activity.

Technique and Management

Close within the core of many of our practical economic problems lie the seeds of real progress and Dr. Karl T. Compton indicated them when he said:

Really epoch-making discoveries are relatively unpredictable in advance. The practical solution to a difficult problem may come from any one of a multitude of directions. Really new ideas do not come to order, and are not pulled out of a hat, and who can tell in whose brain they will germinate.

So I believe that experience, logic and human psychology all support the view that that type of management is most likely to be successful in the long run which directs and inspires but does not too rigidly control, which offers large opportunity for initiative and for criticism, which has faith in mass judgment of an intelligent group and in the genius which may appear in unexpected quarters.

And What Of The Stockholders?

Declaring that the average net earnings of 200 major companies during the past decade has been less than 6 per cent. on their invested capital, A. W. Robertson, chairman of "Westinghouse," said American management should be charged with making too small, not too great profits:

I am surprised the stockholders do not form a union to demand a greater return. Perhaps they need only a John L. Lewis to arouse them. In any case, a lucrative reward awaits

some enterprising person as president of The International Stockholders Protective Union. The I.S.P.U. might serve a useful purpose by presenting comprehensive demands for a greater share of the income of business to offset the insistent demands of other groups.

It should be borne in mind, that in this age management does not, as a rule, own the business it manages. It is hired by the owners to run the enterprise and is usually paid enough to keep it from going to some other organization or starting a competing business. Whether it is too much or too little would depend on the circumstances, but I do know that the salaries of top management in the average company are less than one per cent. of the payroll, and who would not pay this for good management?

Initiative and Security

Ralph E. Flanders, president of the Jones & Lamson Machine Co., summed up some modern thoughts on security when he pointed out:

What we must learn, is that there is no long-time security without incentive and initiative. For a continuance of achievement in our western civilization, we must strike a balance between the two policies.

We have made real progress these last few years, in defining and accepting our social obligation to youth and age. We have failed in developing the policies and institutions for the productive years of men and women as will make it possible to support these new obligations for youth and age. In the reviving and freeing of the effort of the working years our nation finds its duty and its opportunity. It is during the middle years that the full force of incentive must be applied. Some security for unemployment, accident and illness must be provided. But the whole atmosphere of maturity must be that of production, self-support and the support of society as a whole.

The day of the capitalist has passed. Ownership is no longer as a rule vested in powerful individuals: it is continuously more subdivided. The opportunities of management are increasingly more and more open to those who can only gain them by other means than by inheritance.

Industry's Bookshelf

Copies of these, or any other books published, will be supplied postpaid on receipt of price, or shipped C.O.D., plus postage, where remittance does not accompany order.

Book Department **Box 1405**
CHEMICAL INDUSTRIES **New Haven, Conn.**

The Technology of Solvents by Dr. Otto Jordan, Leonard Hill, Ltd., London, 351 pp. This standard work first published in 1932 is now available in English in a carefully revised and well annotated translation.

Growth of American Manufacturing Areas by Glenn E. McLaughlin, Bureau of Business Research, Pittsburgh, 358 pp., $3.00. An invaluable work on our changing industrial geography which statistically studies 33 areas, but an addition shows the factual causes of the many switches that have taken place since 1869.

Problems in Organic Chemistry by Ernest Hamlin Huntress, McGraw-Hill, N. Y., 270 pp., $2.25. A capital presentation of well chosen problem material for the teaching of organic chemistry—a stimulating method ably applied.

Cost of Government in the United States 1935-37 by Lewis H. Kimmel, Nat'l Indus. Conference Board, N. Y., 163 pp., $3.50. A direful lot of facts and figures, but exceedingly illuminating, especially the excellent chapter on "Social Security Finances."

Timber by H. E. Desch, Macmillan, N. Y., 169 pp., $4.50. A beautiful and useful book which clearly and compactly gives the life story of trees, the structure of wood, the uses of timber.

Technical Progress and Unemployment by Emil Lederer, Internat'l Labour Office, League of Nations, London, 267 pp., $1.50. A notable statement of a well known problem with a searching probe into causes and effects.

Social Control of Industry by George Matthews Modlin and Archibald MacDonald McIsaac, Little, Brown & Co., Boston, 499 pp., $1.40. A modernistic study of the business structure of America, with emphasis on new relations with the public and the Government.

Industrial Price Policies and Economic Progress by Edwin G. Nourse and Horace B. Drury, Brookings Inst., Washington, D. C., 314 pp., $2.50. Modern prices are made by the maker not the market, and this timely book tells why and how and wherefore.

Procedure Handbook of Arc Welding Design and Practice, Lincoln Elec. Co., Cleveland, 1012 pp., $1.50 in U. S. A., $2.00 elsewhere. The fifth edition in five years—itself eloquent testimony of merit—of what has literally become the welder's bible.

Introductory Qualitative Analysis by Warren C. Vosburgh, Macmillan, N. Y., 222 pp., $2.25. A revision and condensation into a one-semester course textbook of the work by Dr. Jacob Cornog and the author.

Second Report on Viscosity and Plasticity by Committee for the Study of Viscosity of the Academy of Sciences at Amsterdam, 287 pp., $7.50. The latest word on the purely scientific and theoretical developments in these fields—a storehouse of invaluable basic data.

Our Trade With Britain by Percy Wells Bidwell, Council on Foreign Relations, N. Y., 129 pp., $1.50. Bears down too heavily on the importance of our exports and is possibly unduly optimistic of mutual benefits, but is an exceedingly interesting and most timely book.

Experiments in Organic Chemistry by Lucius Junius Desha and Larkin Hundley Farinholt, McGraw-Hill, N. Y., 233 pp., $1.75. A laboratory workbook correlated to the senior author's "organic chemistry" and covering both identification and synthesis of the commoner compounds.

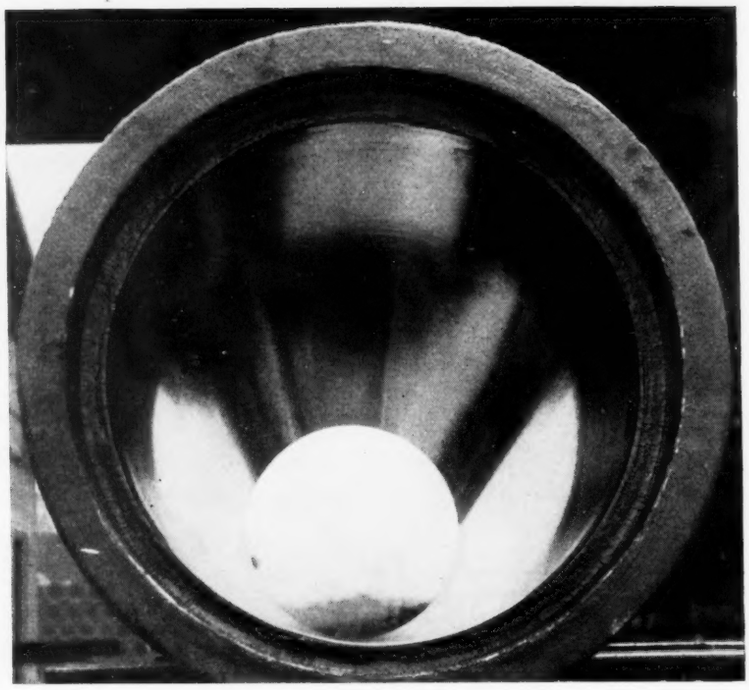
Modern Methods of Refining Lubricating Oils by Vladimir A. Kalichevsky, Reinhold, N. Y., 235 pp. A highly workman-like book, carefully put together to bring to date in clear and logical form, the rapid advances in this important typically American technology with fine patent lists and index.

American Wool Handbook by Werner von Bergen and Herbert R. Mauersberger, Amer. Wool Handbook Co., N. Y., 864 pp., $3.95 in U. S. and Can., $4.75 elsewhere, postage extra. The first attempt for a long time in America to consolidate existing old and much new information concerning the growing of wool, its marketing, grading and use in the woolen and worsted trade. It is a complete, well-illustrated reference book, written in simple and easily understandable English, reflecting primarily American technic and the practical art of converting wool into yarns and fabrics. All phases of wool production and manufacture for the whole American trade as well as the student, economist and consumer are discussed.

Protecting with Pitch

By George B. McComb

The Barrett Company



Mirror-like protective lining—cast iron pipe for the Miami Beach main sewer, manufactured by U. S. Pipe & Foundry Co., coated with Barrett water works enamel.

For other photographs of applications of coal-tar pitch as a protective coating, see pages 388 and 389.

THE high maintenance, replacement costs and depreciation encountered in sewage disposal systems may be greatly reduced by use of proper coal-tar pitch protective coatings, properly applied. Concrete and steel, extensively applied in lines and equipment used for transportation and treatment of sewage, are susceptible to appreciable corrosion and disintegration by active agents such as acids, alkalis and salts which may be present in the waters carried. Concrete thus affected may become susceptible to erosion; and steel, in time, may become appreciably weakened, necessitating high replacement costs. Protection against these effects is an important problem which has received much attention in recent years. Adequate protection increases the life of pipe and most construction materials used in sewage disposal systems, and is worthy of much more consideration than has been generally given to it by cities and municipalities.

Requirements of a satisfactory protective material are in three general classes, *i.e.*, (1) mechanical qualities such as resistance to shocks, settlement, heat, cold, etc.; (2) chemical qualities such as resistance to water, acids, alkalis, oils, greases, bacteria, gases, etc.; and (3) surface characteristics such as resistance to accumulation of deposits and growths.

Satisfactory protective materials meeting these requirements are now compounded from selected coal-tar pitches believed to offer the most economical and effective means of protection from both the mechanical and chemical standpoints. Products include special enamel for coating concrete or steel pipe and tanks; a special primer for use in conjunction with it; a pitch base plastic compound for cold application and certain pitch base paints.

Adequate protection of entire sewage disposal systems may be accomplished by proper use and proper application of these four types of materials. A product designed for coating concrete sewer pipe obviously would not necessarily be required or be suitable, from the application standpoint, for coating the overhead construction of the sewage disposal plant itself. Each product is designed for use in the protection of particular parts of a system and represents the latest development based on trial and extensive experience.

The primer and paints are selected coal-tar pitches with suitable melting points and inherent resistance to corrosive and disintegrating agents, thinned to brushing consistency with a solvent selected for drying characteristics and solvent power. The primer was designed to insure a firm, tenacious and enduring bond between the enamel and the pipe.

The enamel is a specially processed coal-tar pitch compounded with selected mineral fillers. This pitch base imparts to the enamel a low susceptibility to temperature changes which results in resistance to sagging at elevated temperatures and tends to prevent brittleness, shattering, or chipping at low temperatures. This pitch is carefully controlled by rigid tests during its manufacture to insure its suitability for the purpose, and possesses the inherent resistance to water, acids and alkalis which is characteristic of high quality coal-tar pitches. The enamel meets the physical requirements commonly specified to assure satisfactory mechanical performance.

The plastic compound is a selected coal-tar pitch base, brought to proper consistency with solvent and mineral filler for application to the tops of tanks and to other

parts of a sewage disposal plant by trowel or gun. It has also demonstrated its value as an exceptional means of giving protection under such conditions.

Selected coal-tar pitches, such as those used in the manufacture of the latter products, are among the most inert and corrosion-resistant products known with respect to water and to acids and alkalis up to fairly strong concentrations. Accelerated tests and long time exposure tests, coupled with practical commercial applications, have been employed over many years to determine the most suitable types of pitches.

Experiments extending over a period of six years in which bituminous coatings were continuously subjected to water and to 2.5 per cent. solutions of caustic soda and sulfuric acid showed that selected coal-tar pitches were resistant to these solutions to a remarkable extent after six years' exposure. The tests were terminated after six years and the results proved that such pitches would undoubtedly continue giving satisfactory protection indefinitely. The long time resistance of selected coal-tar pitch enamels exposed to corrosive soils and ground waters has been demonstrated many times.

The resistance of coal-tar pitches to the action of petroleum solvents, oils and greases is generally known and recognized. Coal-tar pitch has been widely utilized in the production of coated mineral aggregate for the driveways and operating areas in gasoline filling stations. Such installations have given continued service for years in spite of subjection to the action of oils, greases, etc., which frequently drip upon them. Actual tests have also confirmed this resistance, which is very important in selecting a protective coating for sewage systems. Oils and greases will frequently be found in sewage, usually emulsified in a large volume of water, in spite of ordinances in some localities prohibiting the disposal of such materials into the sewer.

An extremely serious case of corrosion was encountered in the sewage disposal plant at Manasquan, N. J. The proximity of the plant to the ocean made the problem of protection more difficult by introducing another corrosive factor not met with in most localities. Experiments in this plant convinced the Manasquan authorities of the value of specially selected coal-tar pitch base products for use as protective coatings for their plant. After failure with many different products, usually in a comparatively short time after their application, they applied pitch base products sixteen months ago (experimental sections were applied 20 months ago), and their behavior to date has been entirely satisfactory, indicating that they will have long life. Coal-tar pitch enamel applied to experimental pieces of steel pipe and concrete has also been exposed to sewage, gases, and bacteria in the Manasquan plant, and observations indicate that it completely withstands the conditions to which it is exposed, and that it probably will maintain its original condition indefinitely.

Gases from sewage may contain, among other constituents, hydrogen sulfide, carbon dioxide, methane, ammonia, alcohol vapors and various organic vapors. Hydrogen sulfide is perhaps the most corrosive. Coal tar is produced in contact with coal carbonization gases which contain appreciable quantities of hydrogen sulfide. As the coal tar and hydrogen sulfide are in intimate contact at very high temperatures, which promote chemical reaction, it is expected that any tendency for reaction between the two would be satisfied under these conditions, and that the resulting coal tar or pitches so made would be inert to hydrogen sulfide. Experience bears this out; coal-tar pitch base paints give excellent protection against sulfur bearing gases, such as hydrogen sulfide.

Coal-tar products in general have excellent resistance to bacterial action. Many of them are active killing agents for bacteria; outstanding in the protective field are the extensive uses of creosote oil to protect wood against fungi and bacteria. This resistance to bacterial action doubtless contributes appreciably to the performance of coal-tar pitch coatings in contact with sewage; such resistance is essential to effective long-term protection.

Experience in lining pipe used in the water works field indicates that the smooth and mirror-like surface obtained by proper application of selected pitch-base enamels prevents accumulation of deposits and growths and the attendant reduction in effective capacity. The coefficient of flow in pipes with such linings is exceptionally good. Linings with smooth surfaces are readily obtainable with special coal-tar pitch base enamel when properly applied. This is particularly important in transporting sewage.

The use of coal-tar pitch protective coatings in systems for handling sewage is not new. However, this use in the past had not been so thoroughly investigated and perfected, both as to quality of products and methods of application, as is the case at the present time. It is undoubtedly true that formerly coal-tar paints and coatings of numerous types and grades have been utilized or investigated for protection against the various constituents which are ordinarily found in or associated with sewage, and in some instances were found to be unsatisfactory with regard to the protection given or the length of useful service. Investigation has shown that failure of coal-tar products under these conditions is due either to use of an improper grade of material or to faulty application. Too much emphasis cannot be placed on the statement that, when coal-tar pitch coatings are properly constituted and applied, they are most resistant to corrosive sewage conditions.

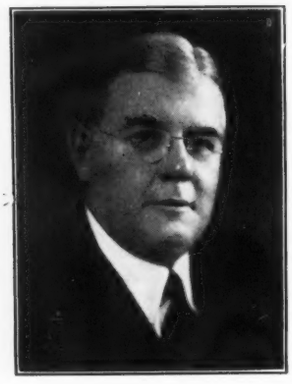
Many years of experience, extensive facilities for development and testing, and the opportunity to select most suitable materials, have made it possible to develop the required technique for preparation and application of coal-tar products in this field. Their value is now demonstrated by actual service, and it is believed that they offer outstanding merit for protection in sewage disposal systems.

CREATING INDUSTRIES
1918—1938

A Series of Fifty Articles Reviewing the Progress of American Chemical Industry

Coal-tar Dyes

By Elvin H. Killheffer



It has been said that all America got out of the World War was our coal-tar dye industry. What we have done with that industry; how completely it has come to fill our color needs; how quietly it has fulfilled the promise of a broader coal-tar chemical development in this country; and why it has become more necessary than ever before to our national comfort, health, and security, is a story which Elvin H. Killheffer is well qualified to write. In fact, he was nominated by his peers (and competitors) to this task. After training at the Philadelphia College of Pharmacy, Philadelphia Textile School, and the University of Pennsylvania, he held two important mill positions, and the outbreak of the War found him chief chemist of Kalle & Co. He became president of the American Color Mfg. Co., and later was chief technician and finally president of the Newport Chemical Works. When this company consolidated with du Pont, he went to Wilmington where he is now a member of the Legal Department staff.

Chemical Containers

By T. P. Callahan

Chemical progress demands many correlated changes. New chemicals not only open new markets, but they also sometimes upset old sources of supply and revolutionize established selling and delivery methods. It is natural therefore that the past twenty years should have shown very considerable changes in methods of packing all sorts of chemical products. But most of us fail to appreciate either the extent or importance of container developments, so that Mr. Callahan's review will open our eyes. He is a capital authority on the subject. After twenty years railroad service he became Traffic Agent of the Merrimac Chemical Company, and today serves as the head of the Specification Containers Division for all of the Monsanto Company. He is Chairman of the Steel Barrels and Drum Committee of the M. C. A., and besides serving that organization on a number of other committees, is a member of the Test and Specification Committee of the Compressed Gas Manufacturers' Ass'n, and Chairman of the Container Section of the National Fire Protection Ass'n.

This Series of Articles will be Continued Each Month

Coal-tar Dyes

1918—1938

By Elvin H. Killheffer

THE position of the American Dye Industry in its relationship to other industries best can be described as that of a keystone, not large of itself but important beyond what its size indicates. This importance is due to its role of supplier of essential materials to many other and larger industries and more importantly to the fact that it is the organic chemical nerve center of the nation.

To get a proper perspective it is well to look briefly at the background against which the industry in the United States was built.

Outbreak of war in 1914, caught us completely unprepared to keep dye-using industries operating. There were men then, as there are now, who saw even in reasonable self-sufficiency, something unnecessary and uneconomic. Several times, when attempts were made to encourage the growth of a dye industry through favorable tariffs, the effort either came to naught or the protection granted was short lived. It was thought that Germany, and to a lesser extent Switzerland, were so preeminent in dye production that the cost of creating such an industry in the United States was quite unjustified.

When war came, most of us expected it to be of very short duration. As we were disillusioned in this expectation, so also were we awakened rudely as to what such complete dependence for dyes on foreign nations meant. What had appeared previously to be an unjustified cost, proved actually to be but a fraction of the stupendous amounts needed to create so complex an industry under conditions of extreme pressure.

Seven plants, with a total of a little more than five hundred men, comprised the American dye industry. Even this nucleus was not self-contained. It was almost entirely dependent on the German industry for its intermediates. Intermediates are so called because they are the products between crude materials and finished dyes. Most of them are very complex compounds, difficult of manufacture, and requiring complicated, expensive plant installation. Even the facilities for producing the necessary crude materials were limited or lacking altogether. With this picture of almost complete unpreparedness before us we must also realize that textile, leather, paper, ink and other industries which consume dyes were rapidly nearing the end of their stocks, and clamoring for aid in their imminent distress.

We imported almost forty-six million pounds of dyes in 1914. That seems small when compared with the huge totals of other industries, but that quantity supplied varied industries of great size and importance. To these industries dyes were not the most important raw material from the standpoint of dollars and yet without dyes they could not operate. It is only necessary to look about us to see the almost universal use of color. Clothes, carpets, shoes, curtains, book bindings, paper, upholstery, inks, call to mind some of the more important uses. The manufacture of any of these essentials depends to a greater or lesser extent on a supply of dyes to make goods saleable. The great number of people employed, the amount of capital invested and the tremendous value of the finished goods produced, depend to an unusual degree on the relatively small amount of dye needed.[1]

Illustrative of this fact are the figures for the textile industry which is the largest single consumer of dyes. For the year 1933[2] the value of its products was over four and a half billion dollars, whereas the value of all dyes consumed in the United States that year was approximately $42,000,000.[3]

Discouraging obstacles had to be overcome before there could be an American Dye Industry. Not the least of these was the formidable array of German patents covering the manufacture of intermediates and dyes. No record of imports or of what the country's consumption had been, either as to quantity or as to the many different varieties, existed. Not until August 1916 did a report by Dr. Thomas H. Norton, Commercial Agent of the Bureau of Foreign and Domestic Commerce of the Department of Commerce, make this information available. It gave the quantities and the declared values of the more than 5,000 brands imported in the fiscal year 1913-1914. At the time, the statement was made—"without such exact information on the extent of the normal domestic consumption of each of the several thousand dyes in current use this new industry thus far lacking in the cycle of the nation's manufacturing activities cannot come into existence except in a costly, haphazard, slow, uncertain manner." That was almost literally the kind of development that had taken place from the outbreak of the war until that time. It had to be so—any dye was better than none—so that initial development was along lines of least resistance.

An interesting side-light is the fact that natural dyes came back into quite general use so that during the year 1916, they reached the peak of imports.

The more than 5,000 brands of dyes enumerated in the Norton Census overdraws the picture somewhat because there were many duplications. Nevertheless, several thousand different dyes were in use in the United States and the Norton Census did provide the first statistical basis necessary for the creation of a new industry which from necessity had to feel its way financially, chemically, mechanically, and commercially.

Under the Tariff Act of 1913, in effect at the outbreak of War, imports of dyes generally were dutiable at 30% ad valorem. Such important products as indigo, alizarine, and their derivatives were admitted free. In 1916, Congress offered encouragement to a rapid development of an American industry by placing an additional special duty of 5c a pound for five years on the general list, but excluded indigo, alizarine, etc., from this special duty.

It required great optimism to expect the establishment of so complex an industry in five years. More important still, the exclusion of such important groups of dyes as indigos, alizarines, the vat colors discouraged development in those dyes, which because of the fastness of the colors they produce were coming into increasing use. Nevertheless, almost 46,000,000 pounds of dyes were manufactured in 1917, one-fifth of which was one color, sulfur black, made by about fifteen manufacturers.

Much of the large 1917 production resulted from the expansion program begun in 1916 by the then largest American manufacturer, Schoellkopf Aniline and Chemical Company at Buffalo. This enabled them to produce intermediates formerly imported and in turn to increase considerably their production of dyes. Attention was concentrated chiefly on those dyes used in largest tonnage.

War Brings New Complications

Entry of the United States into the war in April 1917, introduced new complications. Materials needed for war supplies could only be spared for dye manufacturing in limited amount or not at all. Then again, dyes for uniforms became of first importance. Production of these dyes was greatly expanded, while the manufacture of others was slowed down or stopped. A one-sided production was the inevitable result.

In 1918, under authority of the "Trading with the Enemy Act," licenses were issued permitting use of German patents. This made possible the development of vat dyes which was a long, important step forward. In those cases where the decision had been made to build for permanent participation in the dye industry and where there was adequate financing, attention was given at once to the important question of basic information. Resort was had to two methods of getting this knowledge, namely, through purchase of "know how" and through research. The first was largely a matter of expediency. Where definite process information could be purchased, it resulted in more immediate production of dyes. The same was of course true where Europeans having the knowledge and experience could be employed. The early establishment of definite research programs was the second and sounder method. Most companies, now engaged in the manufacture of dyes in the United States, have never faltered in their belief that unremitting research has been and will continue to be the key to the industry's progress.

Change In Twenty Years

By 1918, there were 78 firms reporting the manufacture of dyes to the U. S. Tariff Commission.[4] How this number has changed during 20 years is shown in Chart No. 1. Of these 78 firms, seven[5] had been manufacturing dyes when War came. Several were textile manufacturers who went into limited dye manufacture in order to help supply their own requirements.[6] Quite a few were former dye distributors. Several were previously in somewhat allied lines, like lakes and paints. A number were engaged in manufacturing products which could also be used as dye intermediates or were manufacturing crude material suitable for making intermediates.[7]

With the Armistice in November, 1918, raw materials which had been going into munitions became more plentiful and lower in price. The same was true of steel and other materials required for plant construction. Chemists and other technicians were released from military service and so became available to the industry. Against these favorable developments was the anticipation of early resumption of activity by foreign manufacturers. Besides, as prices of raw materials fell, so also selling prices of finished goods declined. Taxes were increasing. The unusual military demand for certain dyes ceased abruptly without any compensating demand immediately arising for peace-time requirements.

Confronted with these difficulties the industry devoted itself to consolidating its position. It went to work improving the quality of the dyes already made as well as on the production of a greater variety and, of course, much study was given to the problem of reducing costs. Two happenings in the period 1919-1920 gave new impetus to the industry's development: the creation of the Chemical Foundation and the increasingly successful manufacture of anthraquinone from phthalic anhydride and benzene.

The Chemical Foundation was organized to acquire title to patents held by the Alien Property Custodian. These patents it purchased from the Custodian for $250,000. The Foundation granted licenses under the patents to all responsible American applicants on identical terms. Administering these patents in this way assured their use for the benefit of the industry as a whole rather than for any individual purchasers. Availability of these patents and security in their use, was a great incentive to the development of many of the important dyes which the patents covered.

Synthetic anthraquinone meant freedom from anthracene as a necessary raw material for the production of the faster colors of the anthraquinone series. Commercial production of synthetic anthraquinone was dependent on the development of a cheap source of phthalic anhydride and fortunately this had become available.

Vat dyes were finding increasing use before the war. It was essential that their manufacture be developed in the United States.

In its Dye Census for 1918, the Tariff Commission makes this statement:

> After these pressing current problems have been solved, the research staffs of our new industries, in cooperation with the chemists in the American Universities, can turn their attention to the development of new types of dyes possessing virtues which will enable them to replace dyes now in use.

This statement was perhaps born of the optimism of the moment. The really pressing problem of the new industry at that time was to expand the list of its products to include many needed types which, while already known, were badly needed by consumers for current operations. Consumers were forced to get these missing types from Germany or Switzerland or do without them. Not only was this expansion necessary from a trade point of view, but also from the strictly chemical side it was equally desirable. Filling in the gaps meant producing missing intermediates. These missing intermediates in many cases made possible not only the production of some particular dye, but also helped to fill the gap in some other series.

Of the original companies reporting dye manufacture in 1918, the nineteen listed remain in 1938.[8]

Althouse Chemical Co.
American Aniline Products, Inc.
Calco Chemical Co., Inc. (1)
Chemical Manufacturing Co., Inc.
(Formerly U. S. Color & Chemical Co.)
Cincinnati Chemical Works, Inc.
(Formerly Ault and Wiborg)
Commonwealth Color & Chemical Co.
Cooks Falls Dye Works, Inc.
Dow Chemical Co.
E. I. du Pont de Nemours & Co. (2)
General Aniline Works, Inc.
(Formerly Grasselli Chemical Co.)
Guyan Color & Chemical Works
(Formerly Lamie Chemical Co.)
Holland Aniline Dye Co.
H. Kohnstamm & Co., Inc.
Marietta Dyestuffs Co.
National Aniline & Chemical Co., Inc.
New York Color & Chemical Co.
(Now a division of American Dyewood Co.)
Peerless Color Co.
Poughkeepsie Dyestuff Corp.
(Formerly Palatine Aniline & Chemical Co.)
Zinsser & Co.

Warner-Jenkinson Manufacturing Company first reported the manufacture of food colors in 1919 and Pharma Chemical Corporation began reporting dye manufacture in 1920. Both are in business in 1938.

Charts[9] No. 2 and No. 3 give a clear picture of twenty years[10] of progress. Millions of pounds of production are shown and these are sub-divided into classes according to method of application. By dividing in this way we can see that development has taken place in all groups. Further, the more rapid development of fast dyes in the important vat series is very apparent. The first columns show the quantity of each class imported in 1914, when almost all dyes came from abroad. In every class we now produce more than we imported of the same class before the war. Consumption of dyes in the United States has increased over the years and in addition we are large exporters of many of the simpler and cheaper dyes.

Chart No. 3 also shows the development of the new series of dyes for acetate rayon in the years 1934-1935-1936.

Reviewing a few of the dyes of outstanding importance, we find indigo, first produced by Dow Chemical Company in the fall of 1916, made by three producers in 1918, namely, Dow, National Aniline, and du Pont.

Sulfur black was made in adequate amount and by many producers. The same was true of other bulk colors, acid black, chrome black, direct blue and bismark brown. Direct black was still produced only by National Aniline & Chemical Company.

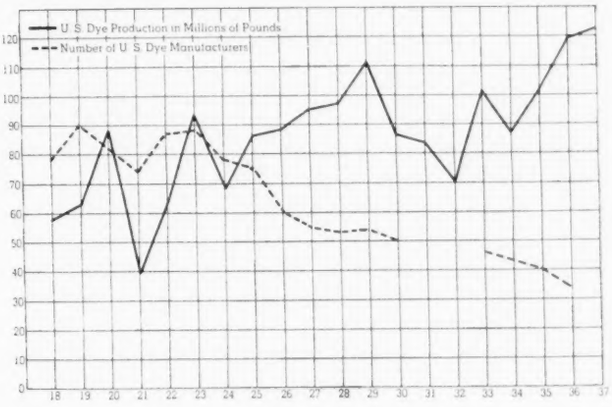


Chart 1.

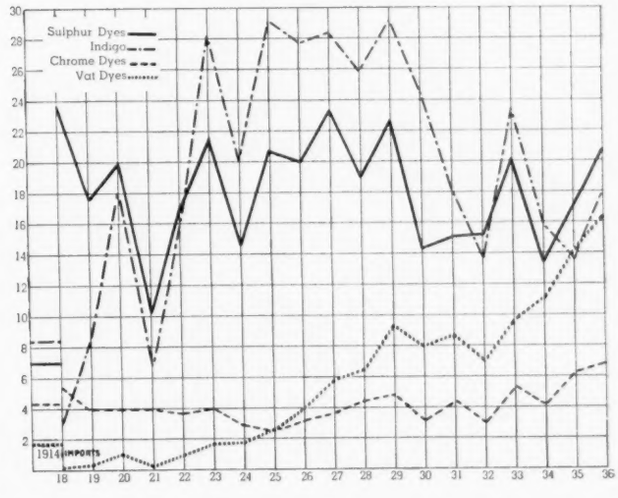


Chart 2. U. S. production by classes (in millions of pounds).

NATIONAL

CARBANTHRENE

PRINTING POWDERS

(INSTANTLY DISPERSABLE)

THE PERFECT VAT PRINTING POWDERS FOR RAYON, COTTON, AND SILK . . . . . .

UNEQUALED PENETRATION WITH ASSURANCE OF CONSISTENT UNIFORMITY ON "REPEATS"

NATIONAL ANILINE AND CHEMICAL COMPANY, Inc.

40 RECTOR STREET — NEW YORK, N. Y.

BOSTON	150 Causeway St.	CHARLOTTE	201-203 W. First St.
PROVIDENCE	15 Westminster St.	GREENSBORO	Jefferson Standard Bldg.
CHICAGO	357 W. Erie St.	ATLANTA	140 Peachtree St.
PHILADELPHIA	200-204 S. Front St.	CHATTANOOGA	James Bldg.
SAN FRANCISCO	145 Second St.	PORTLAND, ORE.	646 N. Thompson St.
	TORONTO	137-145 Wellington St., West	

Branches and Distributors throughout the World.

NATIONAL DYES

The importance of the fast dyes of the anthraquinone series was fully recognized. As mentioned previously, there were patents in the way; there was insufficient anthracene; there was no experience; and in addition, the intermediates and dyes were complex and required heavy investments for plant. As some of these difficulties cleared, a start was made so that in 1919, the du Pont Company reported production of the first four or five colors. The following year there was another producer, The Newport Company. National Aniline was the sole producer of four so-called alizarine dyes until 1920. Brominated indigos were manufactured only by Dow until 1927, since which time there are several other producers.

The year 1921 was the first real test of the ability of the new dye industry in the United States, to compete with its older, longer established foreign competitors. Chart No. 4 shows the course of our exports of dyes. With the reappearance of German dyes in the markets of China, India and Japan, our sales in those markets were immediately limited to the cheaper bulk colors and our exports fell from a high of over $22,000,000 in 1920 to a little over $6,000,000 in 1921. It is true that all dye production decreased precipitately in the United States in 1921, due to the business depression, but whereas there has been general recovery in domestic business since then, it is significant that export business has increased very little in value in the intervening years.

An emergency tariff act of 1921 placed importations of dyes under license control. As early as March 1919, a group of textile manufacturers had sent a cable to President Wilson, then in Europe, which is quoted here:

> The undersigned, representing various branches of the textile industry, respectfully submit that in their opinion an independent, self-sustaining, American dye manufacturing industry is a national necessity; that such a dye industry cannot be established unless competition from German factories, including those in occupied territory, be cut off for a period of years; that no tariff will furnish protection against the enormous resources of the German trust fighting to regain its foreign market; and that only a licensing plan like the British, excluding all foreign dyes reasonably obtainable in the United States, will save the new industry. We respectfully urge that immediate steps be taken to procure both in the peace treaty and in legislation the measures necessary to establish such a plan.
>
> We advocate this not merely because a domestic dye industry is essential to the independence of the American textile industry and manufacture generally, but chiefly because we believe that only through an established dye industry can the Nation secure the progress in chemical education, in the application of chemistry to the arts, and above all in curative medicine, which are indispensable to the national welfare.

The license control in the law of 1921, followed this general pattern.

Congress passed a new tariff law in September 1922, deliberately framed to protect and encourage the American dye industry. It made all imported dyes dutiable at 7c a pound specific and 60% ad valorem. The ad valorem rate was to be reduced to 45% after two years. More importantly, a new principle of valuation was established, the purpose of which was especially to protect those dyes, the manufacture of which was already established. On all imports of competitive products the ad valorem duties were to be assessed on the basis of American selling price.

As the industry increased production it also lowered costs. This in turn enabled it to lower selling prices, as shown in Chart No. 5. In the last few years there has been an increase in the average selling price per pound of all dyes from 45c to 54c. This, however, is accounted for by the tremendous decrease in indigo production (a cheap dye) and a corresponding increase in the high priced vat dyes. A comparison of the prices of dyes imported in 1914 (Norton Census), with the prices of the same dyes produced by American manufacturers, is misleading. These prices are not directly comparable, for in one case they are foreign import values whereas, the prices for U. S. production as given in the Dye Census are average selling prices to consumers.

The number of dye manufacturers has decreased, as shown in Chart No. 1. There are many reasons; the greatest, the character of the industry itself. Success can be attained either by specialization in a limited field that lends itself to such specialization or by a comprehensive

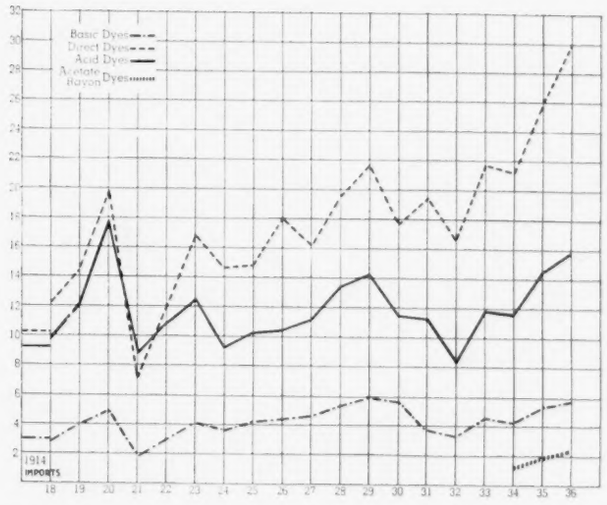


Chart 3. U. S. dye production by classes (in millions of pounds).

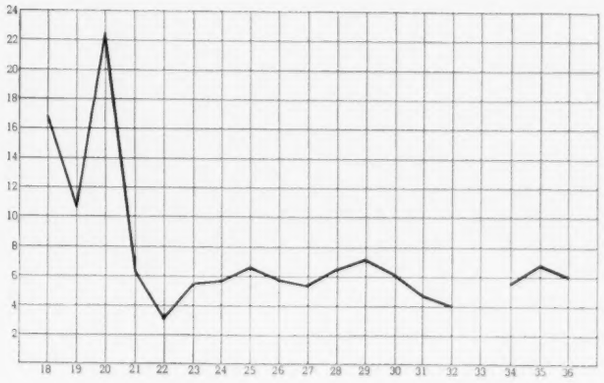


Chart 4. U. S. dye exports (in millions of dollars).

development of the whole field, including all classes of intermediates and dyes. In this respect the economics of this manufacture resemble those surrounding the preparation of our meals. It is obvious that appetizers prepared in one home, soups in another, fish in another, and so on for meat, fowl, salad and dessert, would be wasteful, expensive and altogether impracticable. Assembling the various departments of dye manufacture under one central control has great advantages similar in character to those described in the homely illustration. In Germany this idea is carried through to one central control for the whole industry.

A comprehensive development of the whole field requires huge capital investment and an extensive organization. Naturally we find a comparatively small number of such manufacturers. Just as there is specialization in the preparation of pastries or confections for dinner dessert, so there is specialized manufacture of certain lines of dyes where chemically and economically the products fit together. We have, in 1938, seven manufacturers of comprehensive lines and a much larger number of smaller manufacturers engaged in specialized production.

Chart No. 6 pictures the progress in the variety of dyes made. Since it is often necessary to make several new intermediates to produce one new dye, the progress from year to year in the variety of dyes made is more impressive.

The largest achievement of which the industry may well be proud is the fact of its establishment in all its ramifications in so short a time. This is in itself a tremendous accomplishment. If we are to have any comprehension of this fact, we must contemplate for a brief moment some of the ramifications and what they mean.

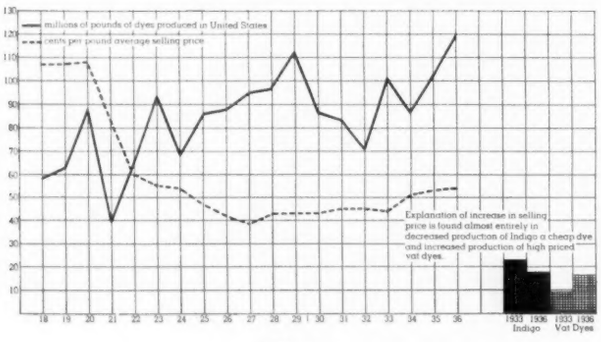

millions of pounds of dyes produced in United States
cents per pound average selling price
Explanation of increase in selling price is found almost entirely in decreased production of Indigo a cheap dye and increased production of high priced vat dyes.
1933 1936 Indigo
1933 1936 Vat Dyes

Chart 5.

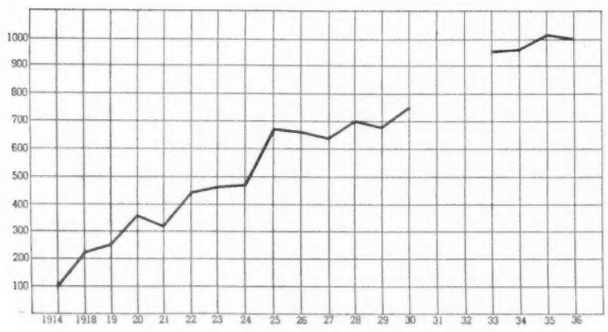


Chart 6. Progress in variety of dyes manufactured.

The number of Ph.D.'s in chemistry granted in the United States each year is now twenty or thirty times what it was in 1914. This results from the stimulation provided by the existence of a dye industry which regularly employs more scientifically trained men than any other industry of comparable size. Academic training is followed by years of experience in research and in operation. The resulting trained and experienced personnel is a far greater national asset than the mere physical equipment with which it works. The rapid growth in the manufacture of improved chemical equipment is itself a result of demands from the dye and other branches of organic chemical manufacture.

The connection of dyes with textiles, paper and leather, is plain. Less obvious are the relationships with other industries. Intermediates used in dye manufacture are the same or closely related to those used in the manufacture of pharmaceuticals, photographic chemicals, perfume and flavoring materials, plasticizers, accelerators and antioxidants for rubber, explosives, food preservatives, synthetic resins, inhibitors, textile assistants, and others.

The industry deals with a great variety of chemical reactions and as a result is capable of handling many chemical manufactures which have little in common with the dye industry except in the matter of solving complex chemical operating problems. Tetraethyl lead, synthetic camphor and synthetic rubber are all good illustrations of this. In 20 years a complicated network of relationships entering almost all phases of national life has been built up.

We know the importance of the industry in times of war through its ability to help in the production of explosives and war gases and the host of other materials needed. In war or peace the dye industry occupies a key production in our national economy.

The United States dye industry has made a very real contribution in the improvement in quality of dyes, more especially vat colors. Starting much later than European manufacturers its first job was to produce the dyes already in use. By concentrating its energies on improving qualities in both paste and powder forms of these dyes, competition was made easier and the consumers were benefited. Improvements took the form of better working qualities or better fastness. Often entirely new types were developed to accomplish these improvements.

In 1919 there was one manufacturer of vat dyes: now there are seven. Since 1920, Eastman Kodak Company regularly produces photochemical dyes. The production of bacteriological stains also began in that year. Specially purified dyes for coloring foods are regularly made by six manufacturers. Azoic and stabilized azoic dyes, first manufactured in the United States by General Aniline Works in 1927, have increased in importance in recent years. They are generally not as fast as the anthraquinone vat dyes, but are

fast enough for many uses. In fact, the stabilized azoic dyes supplement vat dyes in fast color textile printing. For example, bright reds are lacking in the series of anthraquinone vat dyes, but are available in stabilized azoics.

A newer development which holds promise is a series of direct dyes which by a simple formaldehyde after-treatment are made reasonably fast to washing. New or altered fibers or fabrics have also required new or improved dyes. Thus, when cellulose acetate appeared on the market, most dyes then available did not dye the fiber satisfactorily which led to development of a number of new dyes designed especially to supply this need. Likewise, the advent of delustered rayon required some improvements in dyes.

Some new fast pigment colors have been developed, notably a bright fast blue in a new chemical series. Color lakes and toners have been improved as to clarity of shade and powers of easy dispersion. This means, among other things, shorter and easier grinding in producing smoother working printing inks, lacquers, etc.

The fastness deficiencies of the older basic dyes have been improved through the production of phospho tungstic-molybdic lakes of those dyes. This gives us a series which reflect the brilliance and excellent tinctorial strength of basic colors, but which have better fastness. These colors have almost entirely replaced vat dyes in the tinting of papers, for while they cost only about a third as much as vat dyes, they have much greater tinctorial strength.

The industry relies on its unremitting research not only to keep it fully abreast of world chemical developments, but more importantly to supply the new things for the future. An amount is expended annually for research which equals roughly 5% of the sales value of the output. The dye industry in Germany has greater experience over a long period of years, a more extensive line of products; an older organization, and complete coordination. As a result of some or all of these, plus other factors, it has lower costs. The United States is well placed for most raw materials. It does not and cannot have the coordination in one organization. The variety of products made is not so extensive. After twenty years it has personnel organization second to none. Costs are higher, reflecting the higher wage standards which influence all costs whether labor, material, transportation or building. From the viewpoint of dye users, the existence of the industry insures freedom from dependence on foreign sources of supply.

Of much greater importance is the insurance provided the nation as a whole against the former dependence for medicines, pharmaceuticals, photographic chemicals, and a host of other necessities.

---

[1] Statistical Abstract of U. S. 1936—Much higher values in years prior to 1933.

[2] United States production plus imports and minus exports—Dye Census 1934, the nearest year for which comparable figures are available.

[3] The cost of dye used in clothing amounts to very little, 2 to 4c in a lady's dress or 7 to 10c in a man's suit. (Census of Dyes—1925—U. S. Tariff Commission.)

[4] Following the Norton Census and the Special Tariff Legislation of 1916, the United States Tariff Commission began making regular yearly surveys which have been reported in the form of a Dye Census. The information made available has been of great value to the American Dye Industry.

[5] Schoellkopf Aniline and Chemical Works, Heller and Merz Co., Bayer Co., W. Beckers Aniline and Chemical Works, Central Dyestuff Co., Consolidated Color and Chemical Co., Hub Dyestuff and Chemical Co.

[6] United Piece Dye Works manufactured 15 dyes in 1917. Riverside and Dan River Cotton Mills and Cheney Bros. each made a few dyes. Hind and Harrison Plush Co. made Sulphur Black for several years. Springdale Finishing Co. made three or four sulfur dyes.

[7] Newport Company had the crudes available in an associated company. This provided benzol for the manufacture of phenol and toluol for nitration. Du Pont regularly made dinitrophenol and diphenylamin, etc. Sulphur Black from dinitrophenol was a logical development.

[8] In addition to the companies named there are a number of other manufacturers in 1938 who began manufacture subsequent to 1922.

(1) Calco Chemical Co. absorbed a number of prominent manufacturers of 1918, chief among which was Heller & Merz, a pre-war producer.

(2) Du Pont took over the dye manufacturing of Newport Company who were in business in 1918.

[9] Years 1931 and 1932 are missing from most charts shown. The Tariff Commission did not publish the figures for these years.

[10] Figures used end with 1936, as they are the last published by the Dye Census issued by the U. S. Tariff Commission.

Bromine Output Grows

Not so long ago bromine was known to college students chiefly as a vile-smelling, corrosive liquid that had few uses outside of reagent bottles in chemical laboratories. Later it came to be used fairly commonly in photographic and medicinal chemicals of the more expensive sort, but no great quantities were in demand until about 1923 when it began to be employed in the form of ethylene dibromide for making tetraethyl lead antiknock compounds for high-grade motor fuel. Since that year the demand for bromine has grown by leaps and bounds, much faster even than the demand for gasoline itself.

In '37, domestic production of bromine, as reported to the Bureau of Mines, increased to 13,100 short tons valued at $5,180,177 compared with 10,305 tons valued at $4,038,438 in '36. The increase of 27 per cent. compares with a 10 per cent. increase in production of refined gasoline and whereas gasoline production has gained 40 per cent. since '32, bromine production has multiplied almost five-fold, the output in '32 being only 2,864 tons worth $1,182,569.

Commercial sources in the U. S. include brine wells in California, Michigan, Ohio, and West Virginia, and seawater. Increasing quantities of bromine are recovered from saltworks bitterns, but the principal supply now comes from the ocean at Kure Beach, near Wilmington, N. C. Seawater contains only about one lb. of bromine in 2,000 gals., but can be treated economically by modern processes and the supply is inexhaustible. The capacity of the North Carolina seaside plant was expanded again in '37 so that in the latter half of the year it was able to recover bromine at the rate of 10,000 tons annually, handling a volume of water sufficient to supply 10 gals. daily to every man, woman, and child in a city twice as large as New York. Outside of the U. S. bromine is produced in several countries from brine wells and saltworks bitterns, and it is a byproduct of the extensive potash industry established in Palestine on the shores of the Dead Sea. A foreign seawater plant is now being considered, however, to be built on the island of Aruba, Dutch West Indies.

The average value of the output of domestic bromine in '37, as reported to the Bureau of Mines by producers, was a trifle less than 20 cents a pound f.o.b. plant or shipping point. This is a nominal figure as most of the bromine was shipped in the form of ethylene dibromide, potassium and sodium bromide, and other compounds.

The total value of imports of bromine and bromine products in '37 was $225,268, 13 per cent. less than in '36. The ethylene dibromide imported from Germany amounted to 983,075 lbs. worth $190,190, a decrease of 22 per cent. in quantity and 10 per cent. in value.

Chemical Containers

1918—1938

By T. P. Callahan

CHEMICAL containers in general use twenty years ago placed beside those of today would make an astounding exhibit. Such an exhibit, would include, for example, the modern carboy in which the bottle is mechanically suspended in a compact, efficiently braced wooden box sitting beside the old balloon type bottle cushioned with hay, ground cork, or mineral wool enclosed in a cumbersome, bulky box. Similar contrasts would extend to steel drums, burlap and paper bags, cylinders, barrels, wooden and paper shipping cases, bottles, cans, and tank cars.

Such an exhibit would clearly show the great improvement made in the safety features of containers, for this is a paramount consideration of the chemical industry. It would also reveal the economies effected in various shipping containers, for it is of interest to note that present container costs vary from 4% to 13½% of the selling value of the product. The chemical industry alone has an investment of $200,000,000 in returnable containers and does an annual selling value business of $669,000,000.

Through his careful study of container problems and his willingness to disclose his findings to the container manufacturers, the chemical manufacturer has without doubt been the largest single contributing factor to the progress of drum development during the last two decades. Refinement in the process of steel manufacture has resulted in great improvement in quality, uniformity, and finish of steel sheets. Improved steels have been utilized by the drum manufacturer to fabricate more efficient and more economical packages. In many instances this has necessitated on his part the development of new processes and the purchase of new equipment.

The various technical committees of the Manufacturing Chemists' Association and the Compressed Gas Manufacturers' Association have used their influence to promote the adoption and use of the improved containers in order to preserve the splendid safety record which the chemical industry enjoys. An interesting example of this progress is the 50-gallon bilge removable head drum for the shipment of nitrated cotton. In the early stages a drum weighing approximately 110 pounds was used. While entirely satisfactory for the shipment of nitrated cotton, the relation of weight of container to weight of contents was high and the resulting high freight cost was objectionable. New methods of manufacturing and the use of improved quality steel developed the bilge barrel or drum for this service whose weight is approximately 88 pounds.

The early development of drums for sulfuric and mixed nitric and sulfuric acid service centered mainly about the chime seams and the threaded openings, with little attention paid to the type of steel used in fabricating the body and head. This was the three-piece drum (so-called) of foreign manufacture with riveted chimes. It was allowed in transportation till the Bureau of Explosives published specifications for containers when it was outlawed because of leaks developing around the rivets at side seams and chimes. When the Interstate Commerce Commission took over these specifications and outlined the requirements for the so-called acid ICC-5A drum (the master drum of the ICC-5 series) the drum manufactured domestically came into its own. With the introduction of the cold drawn process it was found possible to produce a drum for acid service with almost twice the life of the drums previously in use. The older type of drum had a life of seven to ten trips. The drum made by the cold drawn process can make about twenty trips. Obviously, this longer life has reduced claims for damages incurred because of leaky drums during shipment. While the initial cost of the new type is greater, it has proved considerably more economical.

Prior to 1923 all metal drums for dangerous materials were made of steel of sufficient thickness and strength to allow the safe use of the container time after time. The Steel Barrels and Drums Committee of the Manufacturing Chemists' Association approached the Bureau of Explosives with the idea of a single trip container. Tests revealed that such containers were not only desirable but safe for various inflammable and oxidizing materials. As a result, for the first time specifications were drawn and approved by the Interstate Commerce Commission to cover this new single trip container, fabricated from 18 ga. steel, to be known as ICC-5E S.T.C. This drum now largely supplants the returnable ICC-5 steel drum. Over eight million ICC-5E drums were put in service in 1937. No figures are obtainable on the relative costs of returnable drums as compared with single trip drums. The customer

paid the difference on the whole cost and received back the salvage value of the drum, approximately $1.00.

A stainless steel drum known as ICC-5C has also been developed. This is a comparatively new drum used for higher strengths of nitric acid, but satisfactory, also, for less corrosive acids such as formic and acetic acids.

Among other specification drums those most commonly used are the following:

ICC-5B—Steel returnable drum with expanded hoops. Used for inflammable liquids flashing between 20° and 80° F.

ICC-5F—14-gauge steel returnable drum, restricted to 11 gallons in capacity, used for liquefied petroleum gases.

ICC-5G—Chrome nickel returnable drum for shipping inflammable liquids.

ICC-5H—Lead lined returnable drum for shipping sulfuric acid.

ICC-5J—Single trip steel drums for shipping inflammable liquids flashing between 0° and 20° F.

Improvements In Compressed Gas Cylinders

Outstanding improvements have also been made in cylinders for compressed gases. Formerly, chlorine cylinders were made only of high carbon steel, necessitating the hot drawn process for their production. Improvements in steel have made it possible to produce this cylinder by the cold drawn and spinning processes. The resulting uniformity of metal thickness made possible a reduction in the cylinder weight of as much as 50 pounds.

Early anhydrous ammonia cylinders were manufactured by the forging process, which necessitated the use of concave heads of heavy gauge. Furthermore, such cylinders, because of the relation of length to diameter, had to be handled almost entirely in a horizontal position, which is both awkward and space-consuming. Through the use of improved quality steel and the cold drawn process, a vertical cylinder of the conventional type was introduced and immediately adopted. This is known as the bottle type and has a screwed on cap. It is a decided improvement over the long, cylindrical type previously used, which had a cap bolted to the end to protect the cylinder fittings. This new type cylinder has resulted in substantial savings in both freight and handling costs and has greatly reduced transportation hazards.

A very important container in the chemical industry, in fact, a container that is indispensable, is the glass boxed carboy, ICC-1A, formerly ICC-1. For many years the carboys generally used by the chemical industry were round or balloon shaped. Little attention had been paid to their manufacture or packing. As the demand for these containers increased it was necessary to improve not only the carboy bottle but also the container or box in which it was packed for transportation. Close cooperation between the manufacturer of the carboy and the producer of the box, with the assistance of the Bureau of Explosives and the Manufacturing Chemists' Association, effected such decided improvement that today we have a most efficient standardized carboy and package.

In the olden days almost any round bottle that had but one opening would answer for a carboy. The capacity ranged from five to fifteen gallons. They were made in saucer shaped clay moulds which gave only a semblance of uniformity to the lower portion of the carboy. The upper portion and the neck were dependent entirely upon the skill of the glassblower, and while their variance was kept within a certain latitude, nevertheless considerable variation existed in the contour of the shoulder and neck as well as the length of the neck and the size of the opening, due to the fact that this was "off-hand" work with no mould or pattern as a guide. The neck was rough, simply being severed from the blower's pipe, not refinished or ground. Later, an unfinished ring was laid on, which gave the neck a better appearance and aided in sealing by permitting the tying of the stopper or closure. After this came the tool finished neck which gave a decidedly more uniform corkage and ring.

As the balloon shaped carboy was not an altogether efficient package, straight-sided carboys were blown in a cylindrical clay mould, the bottom and top of which were open. This mould was set on an iron plate which took care of the bottom fairly well, but the open top still left the shoulder and neck to the skill of the workman, resulting in considerable variation in contour and length. The clay mould was soon displaced by the iron mould, which permitted the shaping of a more uniform carboy, as the mould extended over the shoulder and up the neck. It was some time in 1910, as nearly as can be determined, that the iron mould carboys were put into use commercially.

Types of Iron Mould Carboys

Two distinct types of the iron mould carboys were manufactured, the squat type of 12¾ gallons capacity and the taller type holding 12 and 13 gallons. Various types of closures were used—among these the screw neck, ground glass stoppered closure and the regular plain or commercial closure. A few of these finishes were pressed, but it was more practical to use the tool finish, a process of reheating the neck and then tooling it rather than casting or laying on an additional piece of glass with which to make the finish. By this tooling method the carboy and the finish were a solid piece of glass instead of the finish being formed by the addition of a cast ring fused to the rough.

With the two types of straight-sided carboys, the problem of the proper type of box or packing still remained. The old method was to pack with hay, but later ground cork and mineral wool packing were used. In more recent years there has been a strong tendency to get away from the bulk type of packing, substituting special types such as natural cork, ground pressed cork blocks, and rubber blocks.

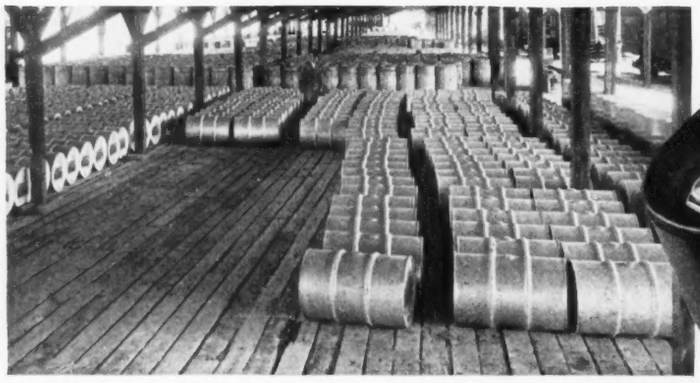
MAKE SURE WITH TRI-SURE

Make sure every drum you ship is protected from
TAMPERING, LEAKS, PILFERAGE, WASTE

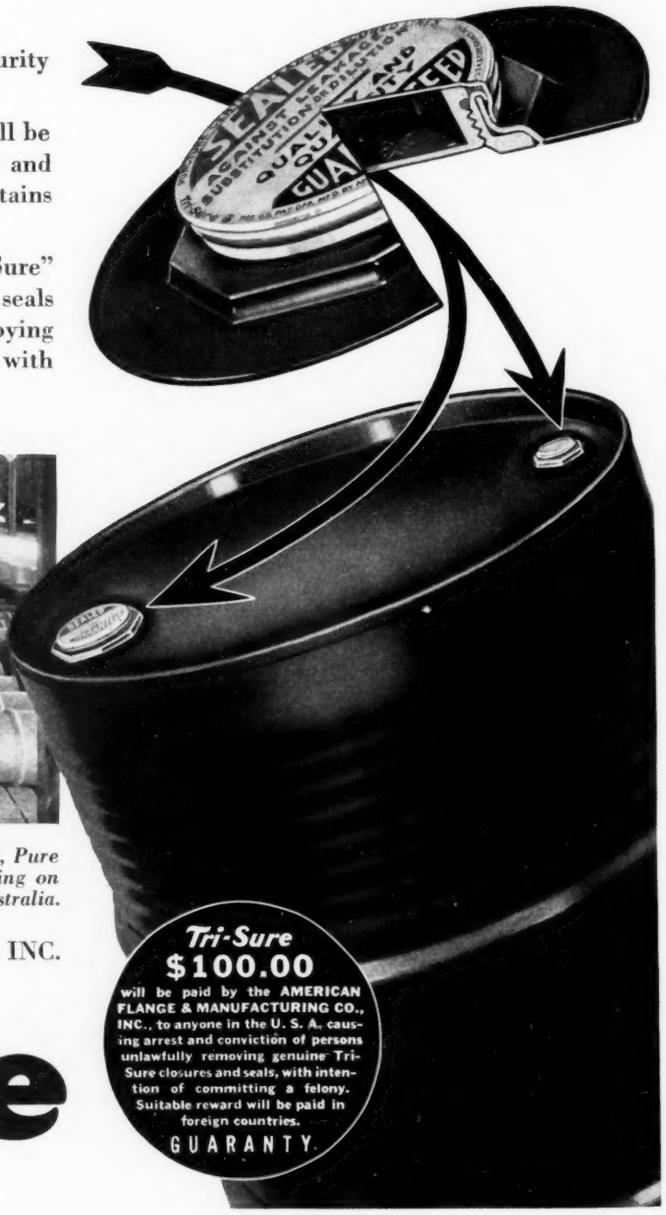
A "Tri-Sure" Closure on a drum is a guarantee of security to both sender and recipient.

To the sender it says, "Every drop of your product will be guarded every mile of the way from tampering, leaks and waste." To the recipient it says, "This drum contains *exactly* the quantity and quality you have purchased."

In your next shipment, why not *make sure* with "Tri-Sure" Closures? Make sure that your product is protected by seals that cannot be removed without deliberately destroying them. Make sure that every drum you ship *arrives* with exactly the same contents it contained when sent.



Shipment of 1076 "Tri-Sure"-equipped drums of "Wando" Brand, Pure Gum Spirits of Turpentine, at Savannah, Georgia, prior to loading on Commonwealth and Dominion Line Steamer for shipment to Australia.


SEALED
AGAINST LEAKAGE
SUBSTITUTION AND DILUTING
Tri-Sure
Tri-Sure
$100.00
will be paid by the AMERICAN FLANGE & MANUFACTURING CO., INC., to anyone in the U. S. A. causing arrest and conviction of persons unlawfully removing genuine Tri-Sure closures and seals, with intention of committing a felony. Suitable reward will be paid in foreign countries.
GUARANTY

AMERICAN FLANGE & MANUFACTURING CO., INC.
30 Rockefeller Plaza, New York

Tri-Sure CLOSURES

Through a special committee established in 1919 by the Manufacturing Chemists' Association and the Bureau of Explosives, efforts were made to devise an efficient testing apparatus for carboys. Several types were constructed, tried, and discarded. Finally, in 1921, an apparatus was developed giving results which could reliably measure the efficiency of the container tested. As a result, carboy swing tests by use of this apparatus became a requirement in 1923.

With accurate carboy testing came the porous earthenware stopper, the asbestos gasket, a wire tie to hold the stopper and, finally, the 13-gallon M. C. A. standard carboy bottle. The development is far-reaching. It brings into use for the first time a standard and exact 13-gallon glass carboy which incorporates the best features of all the other types.

Looking back twenty years to the balloon carboy with the hay packing, with earthenware stopper held in place with brick clay and covered with burlap bagging tied with tarred rope and then coated with hot pitch, one must be impressed with the great progress which has been made in this one container, not only in looks but also in safety. At the same time the tare weight has been reduced from approximately 105 to 70 pounds and a better method of loading and staying carboys in carload and less than carload shipments in open top and box cars, has been developed, reducing carboy breakage to a minimum.

Paper Bags in Place of Containers

Twenty years ago bags were not generally used in the chemical industry. Today paper bags are largely replacing other types of containers. Such burlap bags that were used two decades ago were second-hand and were considered satisfactory from the shippers' standpoint due chiefly to their low cost. However, an increasing demand for a better bag for packing chemicals led the bag manufacturers to further research. As a result, the various types of burlap paperlined, loose creped paperlined, cemented seam moistureproof and waterproof bags have been developed and adopted by the chemical manufacturer. The most recent are the multiwall open mouth and valve paper bags to hold a maximum of one hundred pounds. These are constructed of four to six plies of paper. The use of these bags for various chemical products has resulted in large savings due to greater ease of handling and reduced weight of container.

There will always be a place in the chemical field for both the tight and the slack barrel. Here again there has been decided improvement in the last twenty years, not so much in the tight barrel of the 50-gallon, 8-hoop type, as in the slack barrel, 17″ x 27″, and larger, with one-piece head, crimped steel hoops of 20 and 22 gauge, and tongued and grooved staves. This improvement has resulted in the elimination of head liners, wooden hoops, and the three to six-piece head. The function of the head liner was to help support the head because of the fact that the wooden hoop could not be driven sufficiently tight without breaking.

The modern steel tank cars owned and operated by chemical manufacturers are the outgrowth of a development which began in 1907. In June of that year the matter of safe transportation of explosives and other dangerous articles was placed in the hands of the Bureau of Explosives. Up to this time, the movement of dangerous commodities in tank cars was relatively small, being confined chiefly to shipments of sulfuric acid, liquid caustic soda, crude petroleum oils, naphthas, benzene, etc. The sulfuric tank cars were mostly flat cars with cradles upon which the tank was set. This tank was lead-lined and of approximately 15-ton capacity. After 1917, lead lining was eliminated and steel underframes were built to take tanks of approximately 30 tons capacity, of the head block type, known as Class A. R. A. 11. This was followed by Class A. R. A. 111 of 40 to 50-ton capacity, without head block but with center anchorage.

Prior to 1903, most tank cars were crude affairs, doubtless due to the fact that no definite specifications existed, and if the running gear passed inspection it was presumed that the tank was satisfactory. The earlier tank cars had very little steel in their construction because long heavy freight trains were not used. Therefore, wood center sills, wood truck bolsters, wood end blocks, etc., were the rule. Furthermore, these earlier tank cars lacked air brakes and all modern safety appliances. However, as more tank cars came into use, some steel was worked into their manufacture to reinforce the wooden construction until, today, we have tank cars with heavy steel center sills, braced steel truck bolsters and body bolsters, reinforced steel end sills and end side sills, and a tank riveted to the center sill by center anchors.

Another improvement is steel side frame trucks and underframes that are interchangeable on different types of cars, the changes in classes of cars (as indicated above) being inherent with the details of construction of the tanks that are put on the cars. As a consequence, we have gone from 40 and 50 tons to 70 and even 100 tons in the case of sulfuric acid cars, which are known as Class ICC-103A. This latter specification became effective July 1, 1927 for corrosive liquids such as sulfuric and mixed acids. The Class ICC-103 tank car was the outgrowth of the A. R. A. specification Class 1-11-111 for shipping sulfuric acid, mixed acid, alcohol, benzine, benzol, coal tar oil, crude coal tar naphtha, light oil, gasoline, etc. Many improvements have been made in this type of tank car and large savings have accrued.

The ICC-104 tank car was designed to carry more volatile liquids having a vapor pressure of not over 20 lbs. per sq. in. at 100° F. with a 60 lb. pressure per sq. in. for the tank. As a modification of this,

Class ICC-104A was developed in 1927 to provide for liquids having higher vapor pressure not exceeding 33 lbs. per sq. in. at 70° F. Shipment of sulfur dioxide, methyl chloride, anhydrous ammonia, chlorine, propane, etc., is in the ICC-105 insulated tank car and also the ICC-106, which is the multi-unit car of 15 one-ton tanks. These fifteen tanks are loaded on cradles which are transverse to the car and locked in place. The tanks are so arranged in the cradles that they can be removed from the car for emptying by a derrick to location.

Another interesting tank car development is the dry-flo car for bulk shipments of dry commodities. This type loads through the top and unloads through a single outlet at the bottom. The unloading machinery is inside the car. Endless chain conveyors driven by a motor in the center dome easily move such hard-packed commodities as cement, pebble lime, hydrated lime, soda ash and various other dry chemicals. The economies inherent in this car are not confined to eliminating the costs of loading and unloading. Where bulk shipments are made in the ordinary type of box car, dust is an expensive nuisance. Where the handling of certain chemicals is dangerous, this means added cost. With the dry-flo car both these obstacles are overcome. The dry-flo car has a decided advantage over loose bulk in box cars on reduced labor in handling and by the elimination of packaging expense. Savings as high as $5.00 a ton in shipping costs have been reported.

While great strides have been made in containers of various types for the chemical industry over the last two decades, the next twenty years will bring new manufacturing processes and new products. There will be changes in chemical production methods, but always a major concern of the chemical industry will be safe transportation and economical distribution to consumers. New developments of products or new processes in the chemical industry will succeed or fail largely according to low-cost distribution. Reductions in cost of production often prove incidental when compared with the economies possible through better packaging.

Iodine Shipments, 1937

Reversing the recent down trend, production of American iodine, as reported to the Bureau of Mines, increased in '37 to 299,286 lbs. valued at $242,422, compared with 233,925 lbs. worth $212,635 in '36. Last year's output has been exceeded in only one year, '33, when it jumped to 401,425 lbs. valued at $669,289. Imports likewise rose sharply last year, reaching an all-time high of 1,967,148 lbs., compared with 592,217 lbs. in '36 and a previous record of 1,481,123 lbs. in '34. Value of the '37 imports, however, was only $1,784,491, or a little over 90 cents a lb., whereas prior to '33, when domestic production began to be important, imported iodine was valued at over $3.50 a lb.

Names of the Month—

A Current Supplement to the Chemical Who's Who

CORTELYOU, Warren Pratt, prof. physical sciences, Frances Shimer Junior College; b. Oblong, Ill., 28 Mar. 1908; mar. Ethaline Hartge, Hornell, N. Y., 18 Apr. 1930; 1 dau.; educat., Univ. Cincinnati, Univ. Illinois, B.S. in Chem., 1929, Alfred Univ., Ohio State Univ., Cornell Univ., State Univ. Ia., Ph.D., 1937. Asst. prof. analytical chem., New York State College of Ceramics; Alfred Univ., 1929-36; prof. physical sciences, Frances Shimer Junior College, 1937 to date. Author of papers on theory and teaching of quantitative analysis, and revised "Popoff's Quantitative Analysis," with M. J. Rice. Memb., A.C.S., Am. Ass'n Univ. Profs., Phi Lambda Upsilon, Phi Delta Kappa, Delta Sigma Phi. Hobbies: motoring, golf, amateur radio. Address: Frances Shimer Junior College, Mt. Carroll, Ill.

MUHLEMAN, George Washington, prof. chem., Hamline Univ.; b. Hannibal, O., 26 Apr. 1871; mar. Pamelia Florence Woods, La Moille, Ill., 7 Sept. 1898; educat., Northwestern, B.S., 1899; Ia. State Univ., M.S., 1912; U. of Geneva, D.Sc., 1927; Grad. work at Chgo. Univ., Univ. Minn., Northwestern, Harvard. Milwaukee pub. schools, 3 years; Darlington, Wis., 1899-03; Moline, Ill., 1903-08; Plano, Ill., prin., 1908-09; Marengo, Ill., supt., 1909-10; Ia. State Teachers Coll., college work, 1910-11; Ia. State Univ., Univ. of Chgo., Northwestern, grad. asst., 1911-13; Methodist Univ. of Okla., prof. chem., 1913-15; Davenport, Ia., administrator, 1915-16; Mt. Union Coll., prof. chem., 1916-18; Hamline Univ., prof. chem., 1918 to date. Memb., A.C.S., Swiss Chem. Soc., A.A.A.S., Am. Ass'n Univ. Profs., Phi Beta Kappa, Masons, Eastern Star. Clubs: Hippodrome Skating Rink, Schubert Music Club, Men's Forum. Hobbies: tennis, skating, swimming, horseback riding, gardening, singing, motoring, billiards, solitaire. Address: Hamline Univ., St. Paul, Minn.

SIBLEY, Robert Luther, res. dir., Monsanto Chem. Co.; b. Spencer, Mass., 24 May 1888; mar. Jane Goodrich, Akron, O., 24 June 1915; 2 sons, 2 daus.; educat., Clark, A.B. 1910, A.M. 1911. Hobart College, instr. chem., 1911-13; Princeton, asst. chem., 1913-14; Akron Univ., asst. prof. chem., 1914-18; Goodyear Tire & Rubber Co., res. chem., 1918-21; Stand. Oil Co. N. J., pat. atty., 1921-26; Rubber Serv. Labs., Div. Monsanto Chem. Co., res. dir., 1929 to date. Invent. about 50 pats. on chem. and processes employed in rubber industry. Memb. A.C.S., A.I.Ch.E. Clubs: Chemists'. Address: Nitro, W. Va.

STANKO, John Joseph, chem., Amer. Mineral Co.; b. Pueblo, Colorado, 8 Mar. 1910; mar. Angela Wodeshik, Pueblo, Colorado, 27 Nov. 1935; 1 son; educat., Regis, A.B., 1927-31; Catholic Univ. of Amer., Ph.D., 1931-35. Amer. Mineral Co., 1935 to date. Address: 2808 S. Pacific, San Pedro, Calif.

WIEGAND, William Bryan, dir. of res., Columbian Carbon Co.; b. Conestogo, Ont., Canada, 17 Feb. 1889; mar. Janet Lee, Gloucester, Mass., 17 June 1925; 4 sons, 1 dau.; educat., Univ. of Toronto, B.A. chem., 1912, M.A. physics, 1913. Dominion Rubber Co., Canada, gen'l tech. supt., 1913-20; Ames-Holden-McCready, Canada, dir. of mfg., 1920-22, managing dir., 1922-25; Binney & Smith Co., N.Y.C., dir. of res., 1925-36; Columbian Carbon Co., N.Y.C., dir. of res. 1936 to date. Memb. Inst. of Rubber Industry, Canadian Inst. of Chemists, A.I.Ch., A.I.C.E. Clubs: Univ. Club of Montreal, Chemists'. Hobby: yachting. Address: Ballwood Road, Old Greenwich, Conn.

SULPHURIC ACID

IMMEDIATE DELIVERY FROM 12 PRODUCING POINTS

Prime Commercial quality, produced from pure brimstone Sulphur. Suitable for all major consuming industries. Shipped in our own container equipment — tank boats, tank cars, tank wagons, drums, carboys. Plants at North Weymouth, Mass., Carteret, N. J., Buffalo, Cleveland, Detroit, Baltimore, Alexandria, Va., Columbia, S. C., Charleston, S. C., Savannah, Ga., Pensacola, Fla., Montgomery, Ala.

"AA QUALITY" CHEMICAL PRODUCTS

Monocalcium Phosphate	Carbonate of Ammonia	Sulphuric Acid
Dicalcium Phosphate	Bone Black Pigments	Gelatins
Disodium Phosphate	Sodium Silicofluoride	Phosphorus
Trisodium Phosphate	Sod. Acid Pyro Phosphate	Phosphoric Acid

The AMERICAN AGRICULTURAL CHEMICAL Co.

50 Church Street, New York

33 Offices in Principal Cities in U. S., Cuba and Canada

National

INDUSTRIAL CHEMICALS

SERVING THE SYNTHETIC RESIN, PLASTIC, SOLVENT AND PLASTICIZER INDUSTRIES

Phthalic Anhydride | **Maleic (Toxilic) Acid**

Maleic (Toxilic) Anhydride | **Malic Acid**

Succinic Acid | **Succinic Anhydride**

Fumaric Acid

DESCRIPTIVE BOOKLET SHOWING OUR COMPLETE LINE OF COAL TAR DERIVATIVES ON REQUEST

We solicit your inquiries on all organic products

NATIONAL QUALITY

NATIONAL ANILINE & CHEMICAL CO., INC.

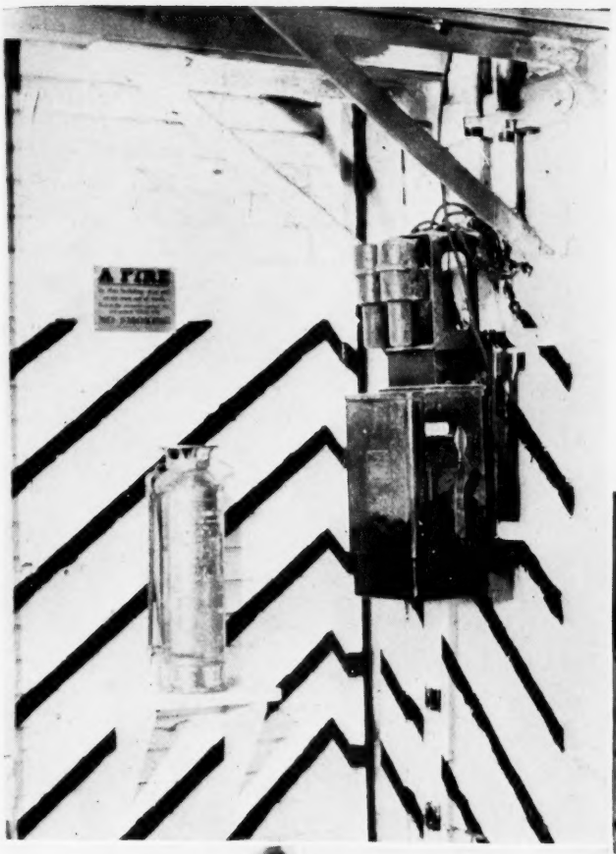
40 RECTOR STREET • NEW YORK, N. Y.

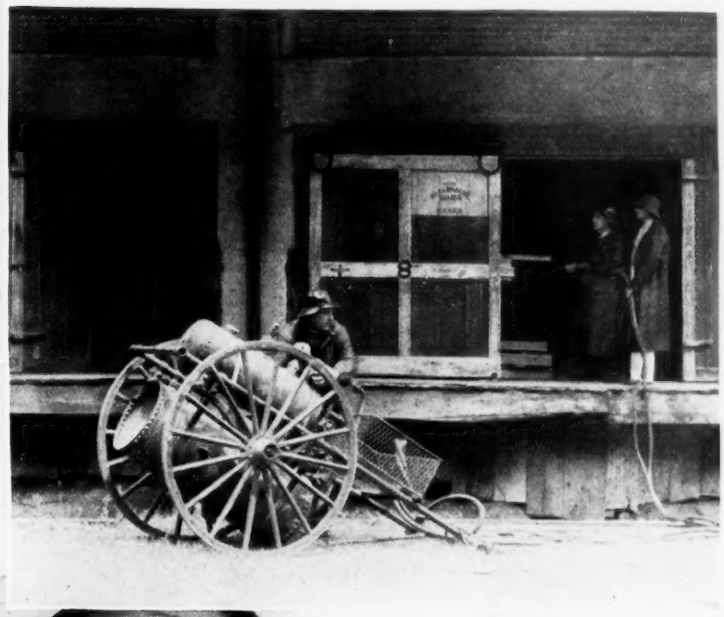
Branches and Distributors Throughout the World

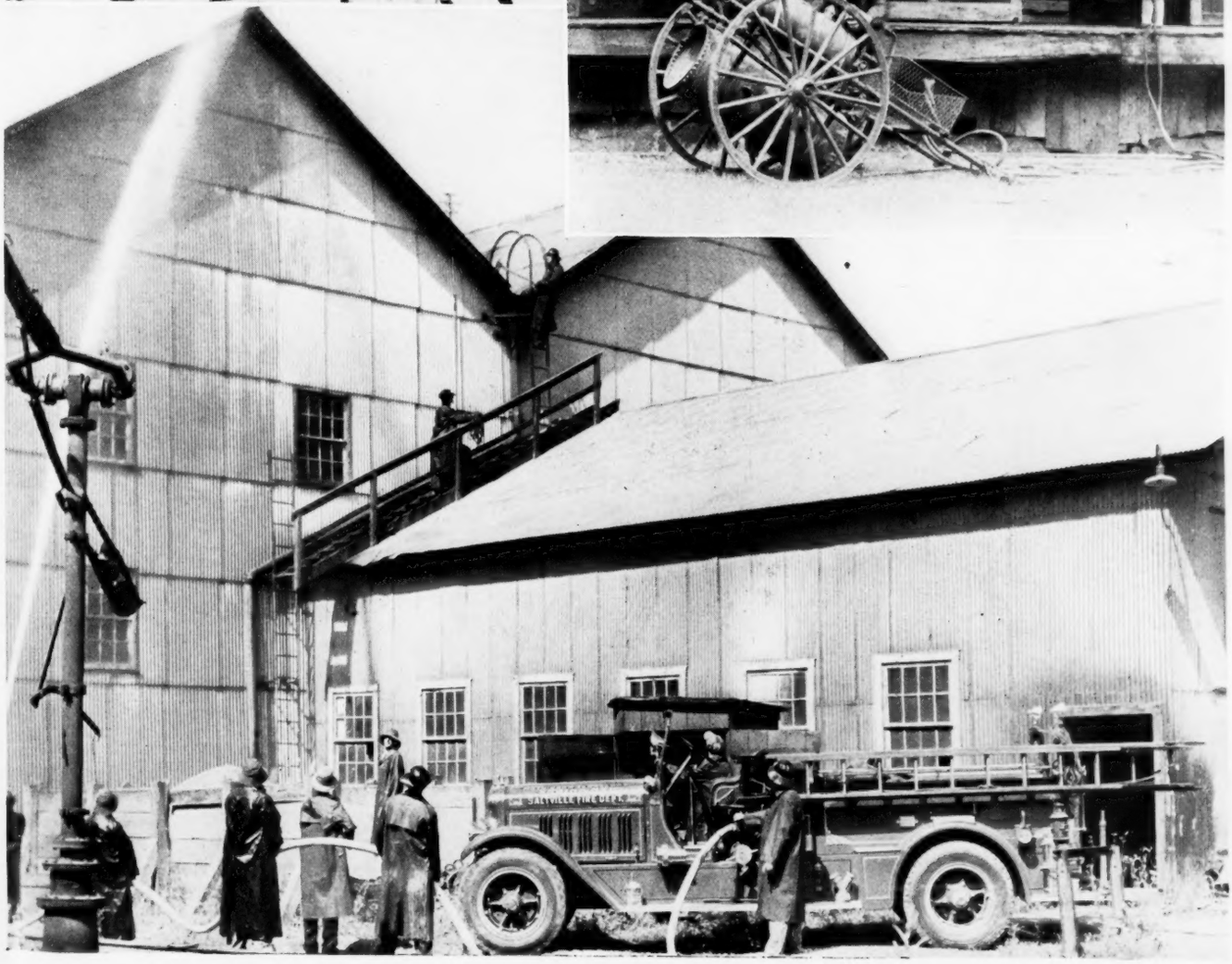
INTERMEDIATES

Safety From Fire

In a continuous process operation, like that at the plant of Mathieson Alkali Works at Saltville, Va., fire protection ranks in importance with safety and production, because, if any of the major operating departments are closed down on account of fire, its production must cease until repairs have been made. The illustrations show three lines of defense against fire at this plant, which have been so effective that only the most trivial fires have occurred there during the past fifteen years. Photo at top, left: The First Line of Defense Against Fire. The chemical extinguisher is wielded by a regular worker on the spot, as soon as the fire breaks out. Note the stripes, making its location conspicuous. Below, right, shows the second line of defense, a large chemical extinguisher on wheels which is rushed by a special squad to the scene of the fire. At the bottom is an illustration of the third line of defense—the 750-GPM automotive pumper which is manned by a trained fire brigade and supplied with water from hydrants located at various strategic points throughout the plant.

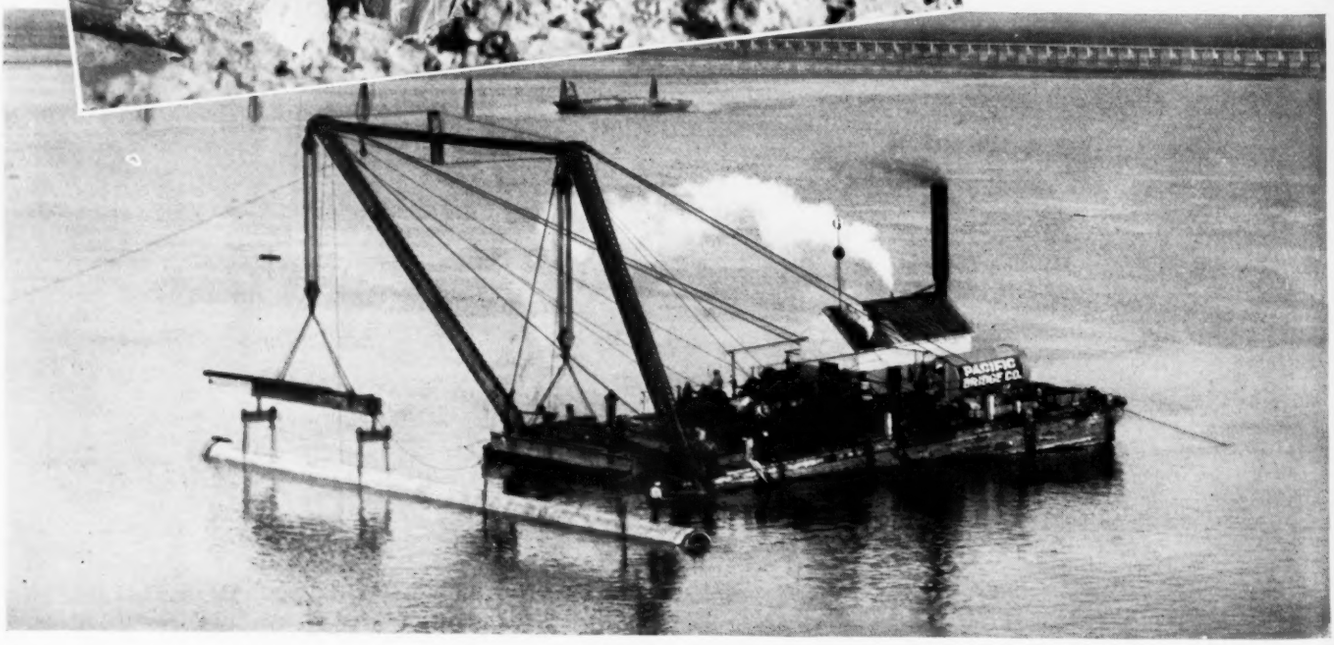






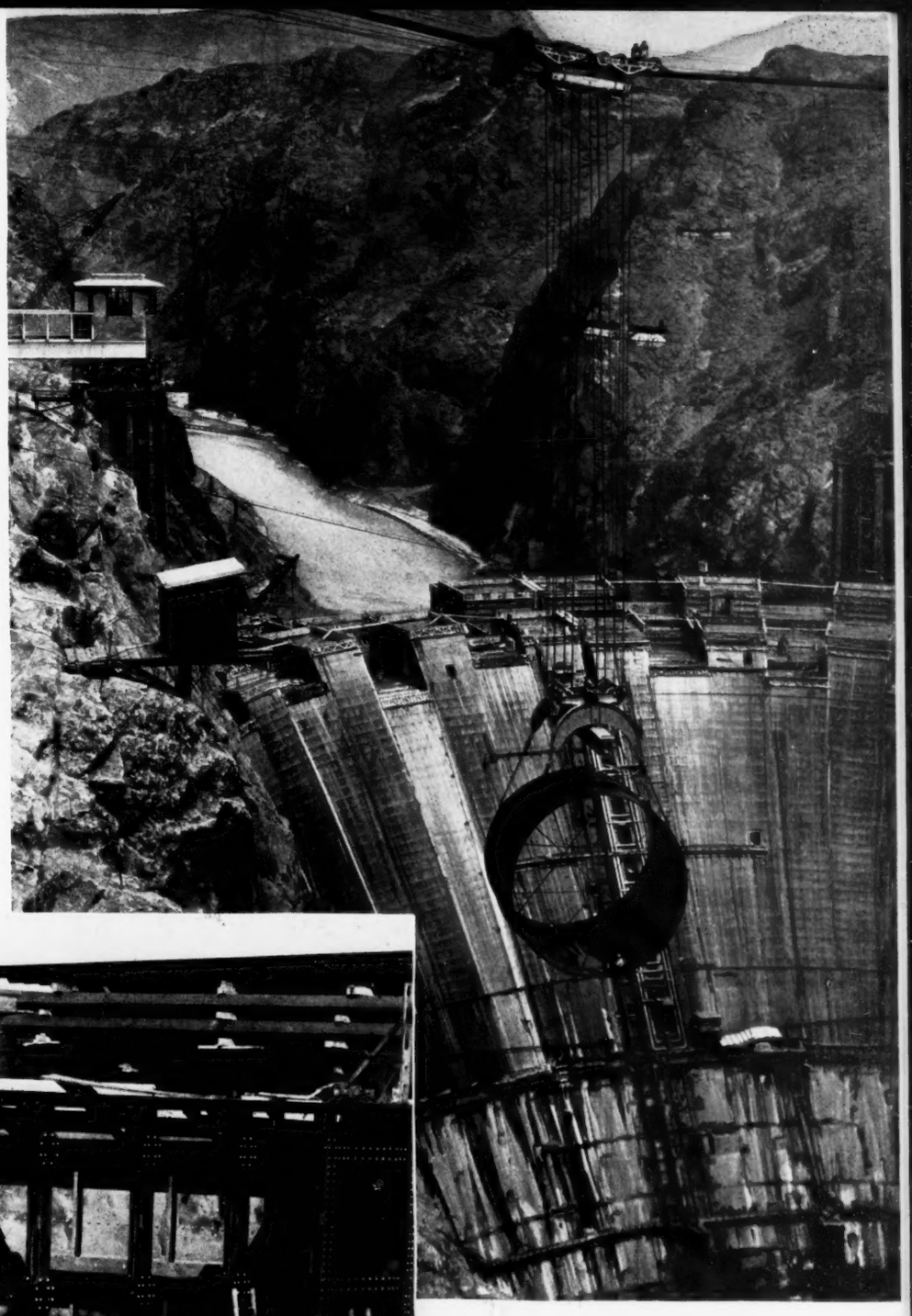
Battery of de-silting units—the All-American Canal portion of Colorado River Aqueduct, Yuma, Ariz. —all exposed metal surfaces treated with protective coatings in 1937.

Center, in the petroleum field—coal-tar pitch protective coating being applied to an eight inch crude oil pipe line by the Standish Pipe Line Co., Thrall, Kans. Below, Submarine Bay Crossing—54 inch steel water mains, under San Francisco Bay, protected with coal-tar pitch.

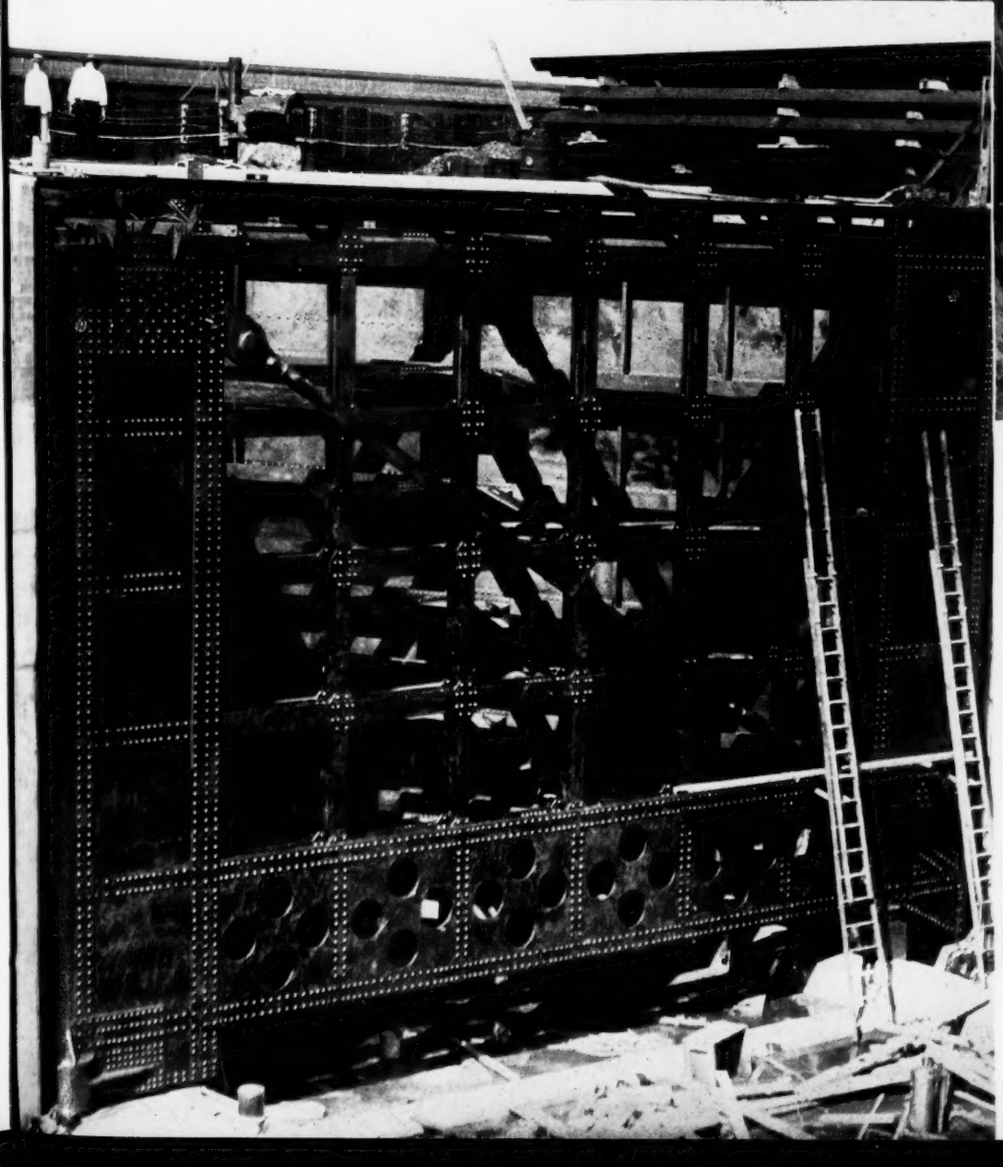


Coal-tar Pitch Coatings in Representative Fields

These illustrations supplement the interesting and informative article on coal-tar pitch protective coatings for sewage disposal systems by George B. McComb of the Barrett Company, on page 370, this issue.



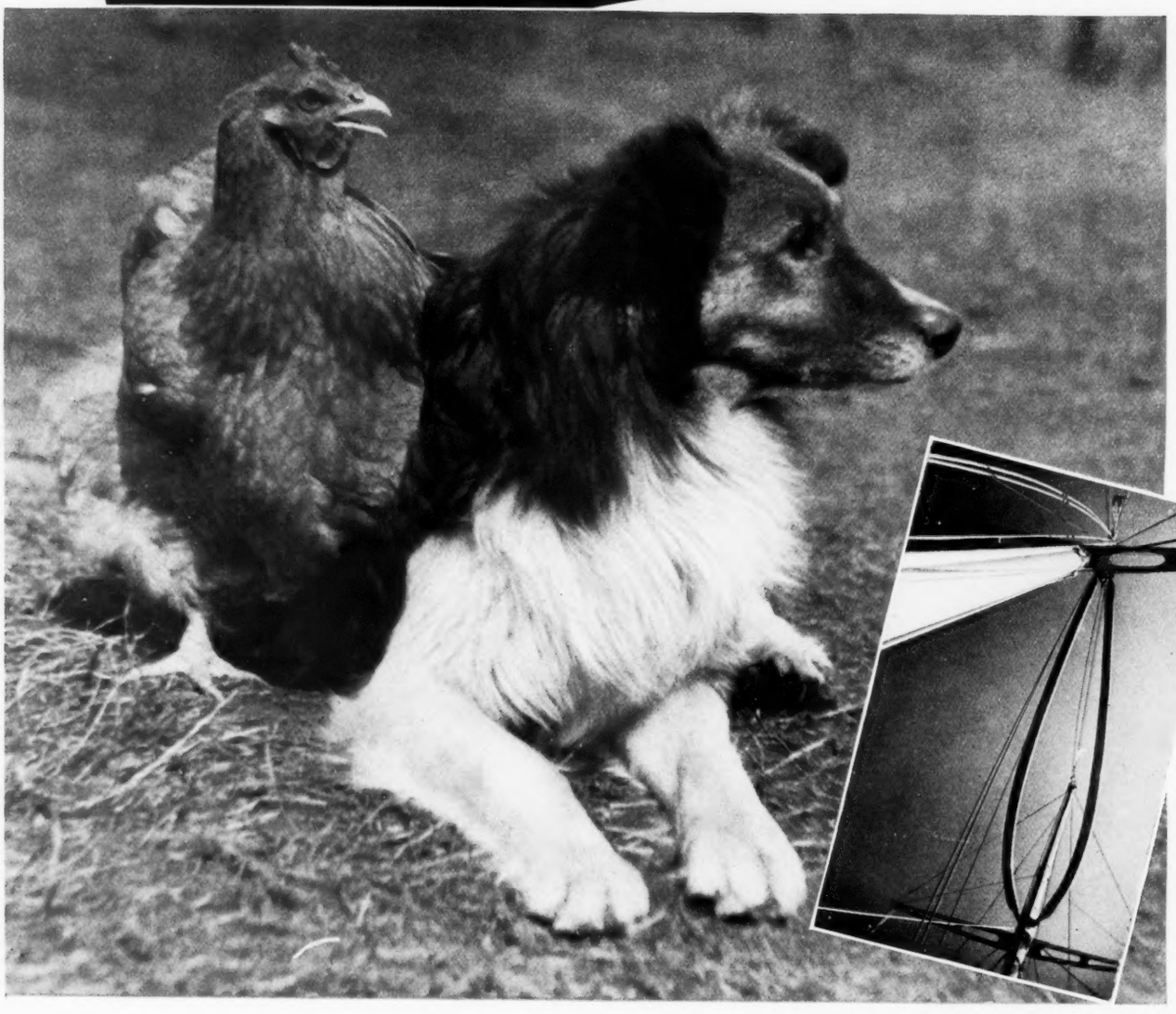
Above, Boulder Dam Penstock section — penstocks completely lined with water works enamel.



Left, Chicago Sanitary District —river control gates—Chicago, 1937. Massive steel river regulating controls coated with specially formulated water works primer and water works enamel of coal-tar origin.

PRIZE PHOTOS

A group of photographs which were prize winners at an exhibit sponsored by the Inco Camera Club, division of the Inco Club of The International Nickel Co., New York City. Photograph at top, by W. L. Bartlett, is entitled "Home Port." "Playmates," shown at the bottom was taken by Walter L. Tetman, and the photograph at lower right, "Banjo Boom," was exhibited by Mr. McKnight.



RIDDLE:

WHEN IS A TABLESPOONFUL . . . HALF EMPTY? . . .

Product problems . . . particularly in the field of phosphates . . . constantly challenge the ingenuity of Victor's research chemists. Typical, was the problem posed by ordinary tri-sodium phosphate . . . long a popular household and industrial water softener and cleanser.

Powerful, quick-acting, ordinary TSP has one admitted drawback . . . much of the material is wasted by frequently using far more than is necessary. Victor research minimized this waste by developing the first *large bulking* TSP . . . known today as Victor "Chip."

The housewife who had been in the habit of using the customary tablespoonful of crystals . . . and thereby getting too much TSP in the dishwater . . . now takes a tablespoonful of "chips" *and gets about half as much!*

Solving product problems . . . developing phosphates to meet special requirements . . . creating new uses for phosphates is work we have happily been doing for over thirty years. Our research department invites inquiries, welcomes the opportunity of serving you.

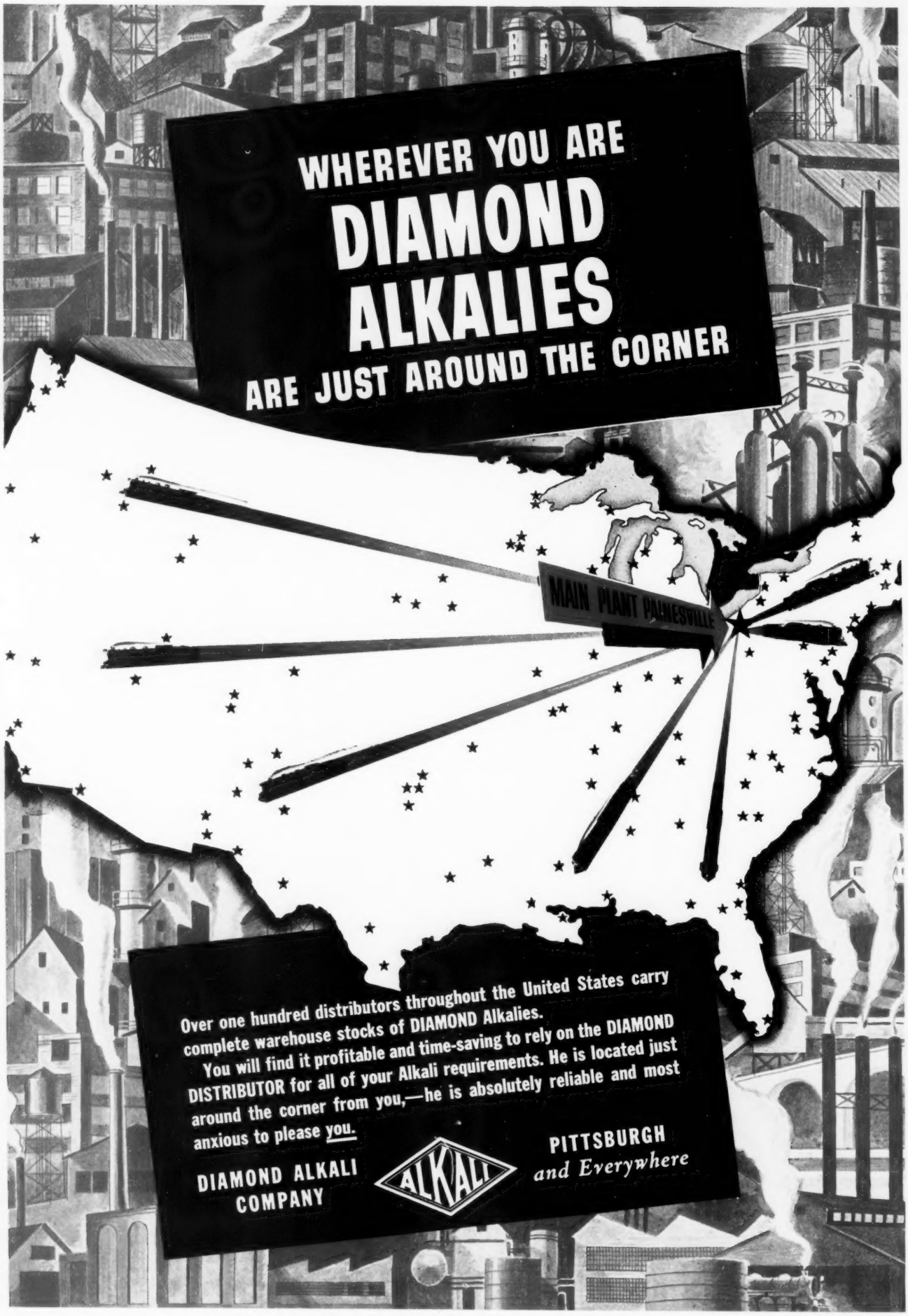
VICTOR CHEMICAL WORKS

141 W. Jackson Blvd., Chicago, Ill.

VICTOR

FAMOUS FOR PHOSPHATES . . . .

HEADQUARTERS FOR PHOSPHORUS . . . . . PHOSPHORIC ACID
AND PHOSPHATES OF ALL KINDS


WHEREVER YOU ARE
DIAMOND
ALKALIES
ARE JUST AROUND THE CORNER
MAIN PLANT PALMESVILLE
Over one hundred distributors throughout the United States carry complete warehouse stocks of DIAMOND Alkalies.
You will find it profitable and time-saving to rely on the DIAMOND DISTRIBUTOR for all of your Alkali requirements. He is located just around the corner from you,—he is absolutely reliable and most anxious to please you.
DIAMOND ALKALI COMPANY
ALKALI
PITTSBURGH
and Everywhere

Plant Operation and Management

A digest of new methods and plant equipment

Recovery of Sulfur from Gases

DETAILS of the new process for the recovery of hydrogen sulfide, carbon dioxide, etc., from industrial gases, worked out by the I.G. and described in a paper by Dr. H. Bähr of the Leunawerke, to the Tenth International Chemistry Congress held in Rome recently (cf. "C.T.J. and C.E.," June 3, 1938, page 465), are given in the complete paper published in *Die Chemische Fabrik,* June 8, and abstracted in *Chemical Trade Journal,* June 17, 1938, p. 508.

Development of the "Alkazid" process, it is pointed out, followed an investigation into the value of weak acids as absorption agents for use in the purification of industrial gases, some of "Alkazid" lyes being mixtures of the salts of aminocarboxylic acids, and the others the alkali phenolates or their derivatives. When use is made of the salts of aminocarboxylic acids for the absorption of hydrogen sulfide, the reaction in the absorption stage is the formation of sodium sulfide, or hydrosulfide, together with the free aminocarboxylic acid. In the regeneration stage, when the temperature is raised, this reaction takes the reverse direction, the hydrogen sulfide being liberated and the sodium salt of the aminocarboxylic acid re-formed.

The process is very flexible, and when dealing with a gas containing both hydrogen sulfide and carbon dioxide, for instance, hydrogen sulfide alone can be absorbed or the two gases can be absorbed together, while it has been found satisfactory for the treatment of industrial gases containing ammonia, tarry, and other impurities.

Reference is made in the paper, to the Koppers Co. development of the so-called phenolate process. The employment of phenolate, according to the author, is covered by the "Alkazid" patents in all cases other than the U.S.A.

Process is described as being extraordinarily simple. The selectivity of "Alkazid" lye, "Dik," for H_2S is said to be so marked that from a gas mixture consisting of 5 per cent. H_2S and 95 per cent. carbon dioxide, a hydrogen sulfide of 50—60 per cent. concentration can be produced. Similarly, hydrogen sulfide can be removed from liquids such as benzene, benzole or oil.

Since its recent introduction, the process has made great headway. In Germany alone, over 4 million cubic metres of gas per day are being purified by the method. Process has been employed for several years past in two synthetic petrol works for the purification of the water-gas and the waste-hydrogenation gas. Outside Germany, a large plant for the purification, by the "Alkazid," of contact gases from carbon dioxide is in operation. A number of further plants for the removal of hydrogen sulfide and carbon dioxide, for petrol and lubricating oil synthesis, have recently been started up in Germany and abroad, while a further twelve plants are under construction. About 30,000 tons a year of sulfur are now being recovered in Germany by the "Alkazid" process, or more than half the total German sulfur output.

In the original Claus Process, the hydrogen sulfide-containing gases, admixed with air or oxygen, are passed directly through the contact mass, but the efficiency of the plant is limited by the large quantities of heat liberated by the reaction, one cubic metre of contact space usually only being capable of converting two to three cubic metres of hydrogen sulfide-containing gas per hour. This is due to the necessity for eliminating, by radiation, the heat formed during the combustion with the object of preventing the further oxidation of the sulfur produced to sulfur dioxide. In the improved Claus Process, the mixture of hydrogen sulfide and air is first burned to sulfur dioxide and water in the tubes of a water-boiler, the heat of the reaction being utilized for raising steam. In the second stage, the sulfur dioxide produced, reinforced by additional supplies of hydrogen sulfide, is passed through the Claus contact furnace, when the quantity of hydrogen sulfide decomposed per hour per cubic metre of contact space is about 200—300 cubic metres.

(*a*) Old Claus Process:

$3H_2S + 1\frac{1}{2}O_2 = 3S + 3H_2O +$ 159 Heat Units (in Claus Converter).

(*b*) Improved I.G. Claus Process:

(1) $H_2S + 1\frac{1}{2}O_2 = SO_2 + H_2O +$ 124 Heat Units (in steam boiler).

(2) $SO_2 + 2H_2S = 3S + 2H_2O +$ 35 Heat Units (in Claus Converter).

The heat balances of the old and improved Claus processes are shown in the equations above. The recovery plant has been found very simple to operate, the yield of sulfur being between 92 and 94 per cent. of the hydrogen sulfide introduced.

Production of Oxalic Acid

MANUFACTURE of oxalic acid by the process understood to be almost universally employed today, namely, heat decomposition of the alkali formates and conversion of the resultant alkali oxalates into oxalic acid by decomposition with mineral acids, is little known except through the patent literature. The vital part of the process is the thermal conversion of the sodium formate into sodium oxalate (the sodium salts are usually used), since this reaction can take two directions and produce either sodium oxalate or, by more deep-seated decomposition, sodium carbonate, hydrogen and carbon dioxide.

This oxalic-acid process has been in operation at a Russian factory for the past five years, and an account of the fundamental investigations on the conversion of the formate, recently published in the Russian press, and which are claimed to have resulted in improved technique, should be of interest. According to L. Frejdlin, in *The Organic Chemical Industry* (1937, Vol. III, pages 681-686), the mechanism of the thermal decomposition has been studied in the Organic Catalysis Laboratory at Moscow State University. Anhydrous sodium formate, which melts at about 254° C., commences to decompose slowly at 310° C., but by raising the temperature to 389° C., decomposition is completed within a few minutes. Within the temperature range, 333° C. to 388° C., the ratio of oxalate to carbonate in the final product is about equimolecular. At about 388° C., the reaction proceeds very vigorously, and the quantity of oxalate produced is about 91 per cent. of the theoretical. Above 400° C., the oxalate commences to decompose. If the reaction temperature is maintained between 390° C. and 400° C., it is possible to obtain the oxalate in almost theoretical amounts

without the use of a catalyst. On the manufacturing scale, however, this process is impracticable.

Effecting the thermal decomposition in a vacuum does not improve the output of oxalate. Presence of iron oxide decreases speed of the reaction. Results correspond with earlier observations by Russian workers that by carrying out the thermal decomposition in an iron apparatus, the optimal output of oxalic acid can be obtained at 490° C. Presence of copper or its oxide does not slow down the speed of the reaction, and the use of copper linings for the reaction vessel is, therefore, recommended.

The reaction is accelerated by addition of small quantities of the solid products of the reaction (oxalate, carbonate). If more than 30 per cent. of these products is added, the reaction is slowed down; but the quantities of carbonate present in technical sodium formate, or ordinarily produced during the process, do not influence the reaction. On practical grounds, however, caustic soda has been found the most efficient catalyst, provided excess is not used, since in the latter event the alkali mainly catalyzes the production of carbonate. The Russian investigations, that have been confirmed since on the factory scale, point to the use of 1.2 to 1.4 per cent. of caustic soda, on the weight of the formate, as giving the most favorable results. Other points considered in the design of the plants have been the necessity for preventing the temperature of the mass rising above 400° C. and of exhausting the hydrogen evolved.

Another direction in which the investigations have been taken, although in this case it is not certain that they have reached the plant scale, is the use not of sodium formate but of potassium formate, or of mixtures of sodium and potassium formates. Although the melting-point of potassium formate (157° C.) is 96° C. below that of the corresponding sodium salt, exact investigations of the thermal decomposition of the product seem first to have been made by Frejdlin (loc. cit.). At 370° C., the output of potassium oxalate is 1.5 per cent. of the theoretical. On raising the temperature, output increases until the maximum figure of 82 per cent. is reached at 455° C., above this temperature the oxalate being decomposed. Some new catalysts (understood to be mainly metallic hydroxides) have been found particularly effective in reducing the decomposition temperature of potassium formate. It is essential, however, that the formate be very efficiently dehydrated when employing these catalysts.

With these and certain more recent results in mind, there appears a distinct possibility that mixtures of sodium and potassium formates may be converted into oxalate at very good yields at temperatures so low as 220° C. (*Chemical Trade Journal*, June 3, '38, p. 463).

Fermentation Process Applied to Glycerine

In fermentations and propagation processes such as the production of glycerine and the corresponding organism, the process is carried out continuously so that the fermenting liquid is caused to ascend and descend with mechanical or other means keeping the micro-organisms in suspension; and on the last part of the path the suspension means are not employed, the micro-organisms thus separating out, if desired, with the aid of settling agents such as bases or phosphates, and with part of the spent liquid being conveyed to and reintroduced at the beginning. The remaining spent liquid is removed, and any micro-organisms therein may be separated out as by centrifuging. Liquid may be removed at various points in the circuit and reintroduced at an earlier point. Fresh micro-organisms may be introduced at any point of the circuit. Subject is basis of E.P. 486,481 referred to in *Chemical Trade Journal*, Sept. 9, 1938, p. 241.

Electrolytic Manganese Problem Solved

Successful solution of the electrolytic manganese problem, which provides a method for the recovery of high-purity metallic manganese from low-grade ores, devised by the Bureau of Mines, Department of the Interior, is recorded in a progress report just published. The installation of the Electrometallurgical Laboratory at Boulder City, Nevada, and installation and activities of the Pullman, Washington, unit, whose investigations cover the metallurgy of magnesium, are also described. The process for the electrolytic production of manganese from its ores as it now stands is regarded as commercially feasible.

Modified Catalyst for Sulfur Trioxide

A modified vanadium pentoxide catalyst for production of sulfur trioxide is described by Adadourov and Sedasheva (*J. Appl. Chem. U.S.S.R.*, 1938, 11, 598-603). Ordinary vanadium pentoxide catalyst masses have a low volume velocity constant for the oxidation of SO_2, because of the slow rate of desorption of the trioxide produced, whereby the free surface of the catalyst is much reduced. The actual speed of conversion is very high. A catalyst with a large active surface and on which the trioxide is poorly absorbed has been discovered in a chrome-vanadium-antimony combination. This has, at 450°, a higher velocity constant than that of any known contact mass for the oxidation of SO_2. Its volume velocity constant is 100 per cent. greater than that of the ordinary mass, with a 95.3 per cent. efficiency of conversion. (*Chemical Age*, Aug. 13, 1938).

Barytes Bleaching Process

A modified process for bleaching crude highly-ferruginous barytes has been developed at the School of Mines, Adelaide. In this process the ground mineral, while still damp, is passed through a 200-mesh sieve and boiled for approximately 30 minutes with about three times its weight of a solution containing 30 per cent. sulfuric acid and 5 per cent. sodium chloride. When working by the continuous process, in other words, when using the spent acid from a batch for the preliminary treatment of the next lot of crude mineral, the consumption of chemicals per long ton of barytes is given as about 84 lb. of acid and 168 lb. of salt. Process is said to result in an almost snow-white mineral from a crude product containing 35 per cent. iron oxide and 1.08 per cent. silica. (*Chemical Trade Journal*, Sept. 9, 1938, p. 236).

Styrol Synthesis

Ethyl benzol, a part of the xylol fraction obtained by cracking petroleum, can be converted into styrol by treatment with chlorine, according to the authors Popov and Bejlin, *Organic Chemical Industry*, *4*, 152-7. The alphachlorethylbenzol obtained is hydrolyzed and the methylphenylcarbinol which results is dehydrated.

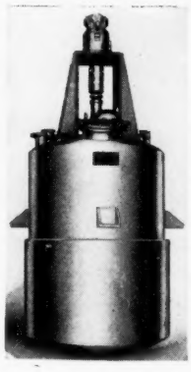
The output and the quality of styrol depend to a high degree on the purity of the ethyl benzol fraction. This is attained by treating the fraction first with sulfuric acid (97 per cent.) and, after neutralization with soda, the product obtained is rectified. Olefines and xylols are thus eliminated.

The optimum output of the styrol fraction, containing 85 to 86 per cent. of pure styrol, is 8 per cent. of the original purified xylol fraction. Since almost the whole amount of aromatic hydrocarbons of the xylol fraction are converted into chlorine derivatives, it is recommended not to take the chlorination process very far, but leave 50 per cent. of hydrocarbon untreated. The treatment with chlorine is best carried out at 100 to 110°; at lower temperatures the action of chlorine on ethyl benzol is not sufficient. The styrol, separated from the dehydration product by distillation *in vacua*, becomes after some days a colorless gelatinous mass. Reported in *Chemical Age*, July 30, 1938, p. 89.

New Equipment

Kettle for Textile Oil Emulsions

A line of kettles for use in the manufacture of textile oil emulsions has been developed by The Patterson Foundry & Machine Co., East Liverpool, O. Kettles are built of stainless steel and can be furnished in a variety of sizes. The one shown is 5 ft. in diameter by 6 ft. 6 in. deep, and is built for 50 pounds internal working pressure and 65 pounds jacket pressure. It is equipped with motor drive and improved type of stirring mechanism. Machines are supplied either with or without vent condensers. All internal parts are ground and polished to insure absolute cleanliness in operation.

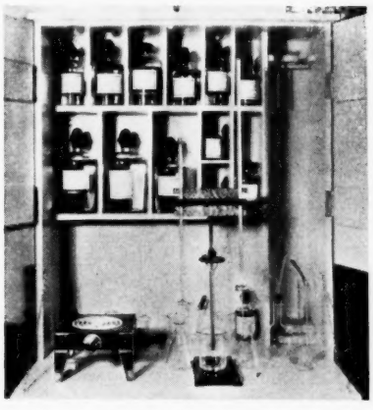


Glass Batch Mixer

A new Rex glass batch mixer, especially designed for the fast and thorough mixing action required in modern glass plant practice, has been introduced by Chain Belt Co., Milwaukee. It is also built to withstand the severe abrasion of the batches. In one installation, a mixing time of three minutes was attained and satisfactory mixes have been obtained in even less time, although this is generally not practical because of the limitations of the related operations. Lower mixing costs are claimed because of the shorter mixing time and the larger tonnages handled. The mixer can be used for either wet or dry batches. For wet mixing, a water tank which measures water to the pound can be supplied. Dust seals are provided for both the charging and discharging ends, thus eliminating all spillage, and all dust is confined to the mixer drum while mixing, charging or discharging. The machine can also be charged or discharged without stopping.

Analytical Test Kit

An analytical test kit made by Hanson-Van Winkle-Munning, Matawan, N. J., is described as "a complete laboratory for the analysis of cyanide zinc solutions." The outfit consists of all of the chemical solutions and apparatus necessary for making the analysis, arranged in a suitable cabinet. The cabinet when closed is dust-tight and can be locked. When the two doors are open and the bottom portion lowered, the bottles of solution are within easy reach, and ample working space is provided. Solutions are analyzed according to the methods given in the booklet "Simple Methods of Analyzing Plating Solutions" issued by the company. These methods are standard, simplified and shortened but, nevertheless, accurate and reproducible. Anyone, regardless of previous experience, can learn in a few hours to control plating solutions by these methods. The solutions are carefully standardized and contained in chemically resistant glass-stoppered bottles.



Furnace Pressure Controller

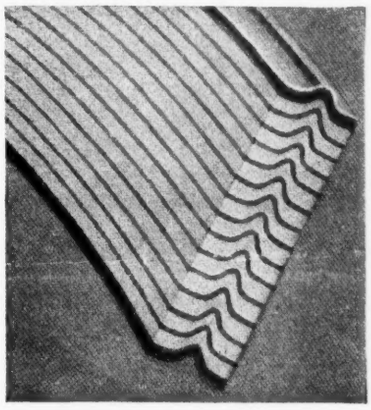
An interesting adaptation for installation on all types of furnaces, stills, kilns, ovens and similar equipment where very low differential or static pressure must be maintained has been developed by Brown Instrument Co., Phila., and is called the Air-o-Line furnace pressure controller. It is applicable for controlling any pressure in the range from—5.0″ H_2O to + 5.0″ H_2O. This instrument has consistently held furnace pressures within plus or minus .002 inches of water on a scale span of 0.2 inches of water. Not only is it accurate, but it is practically instantaneous in operation, as the pointer will move 10 per cent. of the total range in one second, and 100 per cent. of the total range in three seconds.

Globe Valve for Air Installations

A brass globe valve (No. 237) for air installations where quick-opening, quick-closing valves are needed, especially in mines on air lines leading to pneumatic hammers, has been designed by the Crane Co., Chicago. Among its features are an apron on the wheel to protect the upper part of the valve from rough handling and a brass screen in the union connection at the valve inlet to keep out foreign matter. It is made in ¾ and 1-inch sizes and is recommended for 150 lbs. air working pressure.

New Type Gasket

To meet service conditions on modern power plant equipment operating at high pressures, Johns-Manville has developed a new type of gasket constructed of preformed plies of asbestos and cold-rolled, cadmium-plated steel. Known as the "Spirotallic Gasket," it is for sealing manholes, handholes and tube plates. The material is spirally wound in such a manner that the asbestos serves to seat the adjacent, interlocking metal plies. As soon as compression is encountered, the strong, rigid edges of the plies meet the bearing surfaces of the manhole, handhole or tube plate to form a series of metal barriers that provide a tight and effective seal against extreme pressures and high temperature conditions. An outstanding feature of these gaskets is their ability to compress under flange pressure and then to rebound when the pressure is removed. This resiliency is obtained largely by the central crimp of the interlocking plies, which provides a constant spring action that enables the gasket to compress and expand automatically as the gasketing space varies in service.



New Line of Gas Burners

The introduction of a new line of gas burners, representing a revolutionary change in gas burner design, is announced by Coppus Engineering Corp., Worcester, Mass. The Coppus-Dennis Fanmix gas burner uses an entirely different principle of mixing gas and air than heretofore employed. The burner discharges a perfect combustible mixture into the combustion chamber and as a result of the instant ignition a smaller combustion space is required than for an ordinary type of gas burner. Absolutely no flame is visible, making this piece of equipment a radiant heat burner. Other advantages claimed are: Unusually high efficiency, high and even furnace temperatures, no "hot spots," low up-keep, 100 per cent. turn-down ratio, reduction of stack requirements, no cracking of "wet" gas and low cost of installation.

Booklets & Catalogs

How to get these booklets: Companies will be glad to supply copies free, provided "Chemical Industries" is mentioned and the request is made on company stationery. Your business title should also be given.

Air-operated Agitator, leaflet, describes Pneumix Type B, built to handle batches of material up to 100 gals.; outstanding feature of this stirring device is said to be its safety element—spark-proof and cannot heat—a feature of particular interest to handler of inflammable organic compounds and solvents; specifications given, and illustrations. Eclipse Air Brush Co., 390 Park ave., Newark, N. J.

Aluminum News Letter, September, 1938, short article, illustrated, on uses and advantages of aluminum in the process industries. Aluminum Co. of America, Pittsburgh, Pa.

B-A De-Ion Power Fuse, Booklet F.8450, on dry boric-acid power fuses for protection of high-voltage circuits and equipment, describes their application in utility and industrial plants, and for all high-voltage power use; illustrated. Westinghouse Electric & Mfg. Co., Pittsburgh. Pa.

Bailey Motor Control, Bulletin No. 102-B, outlines application of Bailey Steam Flow-Air Flow Automatic Readjustment Type of Air-operated Combustion Control; explains fundamental principles involved in controls, both for boilers fired with stokers and for those fired with fuels in suspension; actual installations are diagrammatically shown and illustrated. Bailey Meter Co., Cleveland, O.

Blast Cleaning Equipment, folder, chiefly a letter on lower blast cleaning costs and how they may be accomplished through use of the Rotoblast system and equipment; illustrated. Pangborn Corp., Hagerstown, Md.

Blast Helmet, folder, announces new DD-4 model, for air blast operators, approved by Bureau of Mines; outstanding features of construction outlined and illustrated; shows also some of company's other well known accessories and supplies. Pangborn Corp., Hagerstown, Md.

C-I-L Oval, August, 1938, contains interesting article on "Glass—A High Temperature Industry in Which Much Blowing is Done." Canadian Industries, Ltd., Montreal, Que., Canada.

Chemical Stoneware, Catalog, complete, comprehensive data on General Ceramics' chemical stoneware manufactured for the process and food industries, contains full information and illustrations of wide range of stoneware shapes available for storing, piping and processing of all industrial acids (with the exception of hydrofluoric acid), also gives installation data, charts of characteristics of centrifugal pumps, technical data on handling corrosive liquids, etc.; additional bulletins may be inserted at any time; divided into twelve classifications of equipment, including pipes and fittings, tanks and jars, pumps, towers, filters, condensers, etc., and full dimensions, drawings, and weights are included. Useful for executives or engineers in this field. General Ceramics Co., 30 Rockefeller Plaza, N. Y. City.

Clad News, Third Quarter, 1938, photographs and descriptions of actual adaptations of Lukens Nickel-Clad Steel, particularly interesting the items on its use in storing phenol and its use in soap equipment. Lukens Steel Co., Coatesville, Pa.

Clean Hardening Motor Car Springs and Shafts with prepared atmospheres, folder, on characteristics of furnaces available for meeting exacting requirements of this business; presents actual operating data, and photographs of installations. Surface Combustion Corp., Toledo, O.

D. C. Explosion-proof Motor, Bulletin No. 520, illustrates and describes new Allis line, incorporating eighteen separate and distinct improved features; inspected and explosion tested by Bureau of Mines, also tested, listed and approved by Underwriters' Labs. Louis Allis Co., Milwaukee, Wis.

Dutch Boy Painter Magazine, Vol. 31, No. 5, 1938, feature article "Painting Asbestos Shingles"; gives mixing formulas; special requirements to be followed are stressed. National Lead Co., 111 B'way, N. Y. City.

Electric Etcher, folder, gives details of newly improved tool for marking positive, permanent identification; special feature is the Diamond Point which permits marking extra hard materials up to 60 Rockwell Hardness. Ideal Commutator Dresser Co., 1345 Park ave., Sycamore, Ill.

Firefax, booklet, brings occasional news of fires, methods and equipment used in combatting this hazard. Pyrene Mfg. Co., Newark, N. J.

Homogeneous Linings that Hold, booklet, illustrates and describes six actual adaptations; lists types of linings available for bonding to various metals. Homogeneous Equipment Co., Downingtown, Pa.

Hotwell and Condensate Pump, Bulletin W-318-B15, announces development of improved two-stage centrifugal hotwell and condensate pump; contains important details of construction, dimension tables, and an interesting sectional view. Worthington Pump & Machy. Corp., Harrison, N. J.

Kent Junior Super 5 Roller Mill, booklet, specifications, illustrations and suggestions for successful operation. Kent Machine Works, Inc., 37 Gold st., Brooklyn, N. Y.

Locklite reflectors and hoods, Catalog Section 61-153, on line available for industrial lighting; tables give information concerning styles, wattage, size, weight and foot candle illumination. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Making H_2S Production convenient and safe, leaflet, describes use of Aitch-Tu-Ess in solving hydrogen sulfide problem; price list given also. Hengar Co., 1833 Chestnut st., Phila., Pa.

Mallinckrodt Price List, September, 1938, Mallinckrodt Chemical Works, St. Louis, Mo.

Metameter System of Telemetering, Bulletin No. 515, detailed information on subject of telemetering instrument readings, complete with line drawings; various models for remote measurement and automatic control of pressure, vacuum, liquid level, temperature, etc., illustrated; valuable for reference files of operating and supervising engineers. Bristol Co., Waterbury, Conn.

Monsanto Current Events, September, 1938, in this issue "The Youngster of the Phosphates" and "Chlorine—The Green Goddess." Monsanto Chemical Co., St. Louis, Mo.

Neoprene Notebook, August, 1938, feature article "Long Time Immersion Tests Show Relation between Swell and Tensile Deterioration." E. I. du Pont de Nemours & Co., Wilmington, Del.

New Wrinkles in Finishing, Vol. 1, No. 1, the debut of an interesting, informative and timely publication on subject of quality finishing; first issue discusses many applications to which company's New Wrinkle Finish is adapted, and the unlimited effects obtainable. New Wrinkle, Inc., Mutual Home Bldg., Dayton, O

Nickel Cast Iron News, September, 1938, new developments in this field, photos of interesting applications, and long time service records of nickel alloy cast irons in industry mentioned. International Nickel Co., 67 Wall st., N. Y. City.

Nickelsworth, Third Quarter, 1938, announces introduction of "Z" Nickel, new nickel alloy which combines corrosion resistance of nickel with mechanical properties of heat-treated steel. International Nickel Co., 67 Wall st., N. Y. City.

Nuglu, abrasive bond for setting up polishing wheels and belts, folder, outstanding features of this grain holding medium; comprehensive information on economy, durability, application, drying, etc., each discussed separately; lists grades available. J. J. Siefen Co., 1936 W. Lafayette blvd., Detroit, Mich.

Peregal O, booklet, gives explicit information on use as vat assistant, penetrant and leveling agent. General Dyestuff Corp., 435 Hudson st., N. Y. City.

Price List, September, 1938, C. P. chemicals and acids and other laboratory and technical chemicals. J. T. Baker Chemical Co., Phillipsburg, N. J.

Process Industries Quarterly, Third Quarter, 1938, largely devoted to rolled nickel as an engineering metal. International Nickel Co., 67 Wall st., N. Y. City.

Progressive Perfumery and Cosmetics, August, 1938, feature article "The Background for Development of American Perfume Bases and Cosmetics." Van Dyk & Co., 57 Wilkinson ave., Jersey City, N. J.

Spray Equipment, Catalog No. 66, informative data on Eclipse spray equipment, stresses advantages and savings gained; includes test data, specifications, illustrations, descriptions and uses. Eclipse Air Brush Co., Newark, N. J.

Synthetic Ketones, Chemical Group Folder No. 6, first of a series of new folders designed to present, briefly and concisely, information on various organic chemical families; present folder covers the applications and properties of fourteen synthetic ketones used as industrial solvents and intermediates; a convenient table shows boiling points, vapor pressures, solubilities, and other properties in a form in which they can be easily compared; other folders of the series, soon to be published, will present similar data on alcohols, glycols, amines, acids, and other organic families. Copies can be obtained from Carbide & Carbon Chemicals Corp., 30 East 42nd st., N. Y. City.

Synthetic Organic Chemicals, September, 1938, feature article discusses Synthetics Used in Perfumery. Eastman Kodak Co., Rochester, N. Y.

Tag Direct Set Indicating Controllers for Temperature and Pressure, Bulletin 1175, supplement to Catalog 1060D, covers Model No. 9-TIC for temperature and Model No. 9-PIC for pressure; new instruments designed for ruggedness and operating convenience, including all the latest TAG developments; describes both the "On-off" and Throttling types of this line; also includes specifications and illustrations. C. J. Tagliabue Mfg. Co., Park and Nostrand aves., Brooklyn, N. Y.

The Cleanser, September, 1938, lists company's specialties—products of particular interest to the laundry and dry cleaning fields. Caled Products Co., Brentwood, Md.

The Laboratory, Vol. 10, No. 1, compilation of interesting items for laboratory workers on manufacture and application of new laboratory instruments and products used in this connection. Fisher Scientific Co., 711 Forbes st., Pittsburgh, Pa.

Thermionic Amplifier for Voltage Measurements in High Resistance Circuits, Catalog E-OOA, on this instrument which adapts any potentiometer of suitable range for glass electrode measurement and other measurements of potential in high resistance circuits; useful in polarization studies; in measurements of corrosion and oxidation-reduction potentials and in resistors of high values. Leeds & Northrup Co., 4934 Stenton ave., Phila., Pa.

Unitair Stationary and Semi-portable Air Compressors, Bulletin A-22, points out and fully describes many refinements and improvements made to this popular line of compact, two-stage, air-cooled compressors, including addition of a larger size, the use of force feed lubrication and the design of simplified automatic stop and start control for motor driven styles; also covers power unit driven types. Sullivan Machinery Co., Michigan City, Ind.

Use of Selenium in the Kjeldahl Digestion, leaflet, points out effectiveness of selenium in accelerating speed of the Digestion; gives simplified Kjeldahl procedure; lists company's equipment in this line, gives prices. Hengar Co., 1833 Chestnut st., Phila., Pa.

Water—A Raw Material for the Paper Industries, by R. T. Sheen, Technical Director, W. H. & L. D. Betz, and H. M. Wilson, Consulting Engineer—a reprint from **Paper Industry** (June, July, 1938) which is applicable to practically all industries. Some of the subjects covered include: Sources of Water; Advantages of Closed Water Systems; Conservation of Heat; Reduction of Pre-treatment of Raw Water; Reduction of Industrial Waste Disposal; Methods of Treatment—Suspended Solids Removal; Other Methods of Treatment; Water Analysis of Typical Board Mill; Boiler Feedwater; Internal Conditioning. Copies may be obtained from W. H. & L. D. Betz, 235 W. Wyoming ave., Phila., Pa.

Westinghouse Micarta Products, Descriptive Data 63-020, lists standard sizes, colors and finishes of Micarta plates; tabulates physical and electrical properties and applications of Micarta plate-rod-channels-angles and tubing; latter properties include such items as punching, machining, strength, dielectric volts/mil. and dielectric constant. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Wire Strippers, folder, on complete line for stripping rubber insulation, asbestos, cambric, etc.; illustrated. Ideal Commutator Dresser Co., 1234 Park ave., Sycamore, Ill.

Wulff pH Tester (Indicator Strip Method), booklet, highly informative, describes its use particularly for accurate work with small or large quantities of highly colored, turbid, viscous mediums containing suspended matter. Pfaltz & Bauer, 350 5th ave., N. Y. City.

New Chemicals for Industry

A digest of products and processes

A.C.S. Milwaukee Papers

At Milwaukee, last month, over two thousand chemists foregathered for the 96th annual meeting of the American Chemical Society. For the benefit of our readers who were unable to attend, we present below, and on the following pages, summaries of some of the outstanding papers delivered.

Industrial Uses of the Furans

By F. N. Peters
Quaker Oats Company

FOR purposes of discussion uses of the furans may be grouped conveniently under the following headings: biological, chemical, physical, and miscellaneous. The biological classification includes preservatives, fungicides, herbicides, disinfectants, and therapeutic agents. Furfural is effective in preventing the growth of mold and bacteria in aqueous suspensions of starch, glue, and similar products. Generally it is a better fungicide than formaldehyde. Mercury hydrofuramide gives excellent control of Diplodia and other dry rot diseases which attack corn. University of California publications indicate that many mercury derivatives of furfural are powerful germicides. When sprayed on sand beaches furfural destroys fungi such as the organism which causes "swimmers' itch." A one per cent. aqueous solution is said to clear up infection by the parasite causing "athletes' foot" and a mixture of talc, boric acid, and hydrofuramide not only prevents this infection, but is frequently effective in treating advanced cases as well as other similar skin troubles.

Mixed with kerosene or light fuel oil, furfural is an excellent herbicide, very small amounts being effective in killing dandelions, and larger quantities being equally good for fairly large vegetation.

Furan, tetrahydrofuran, and the corresponding methyl derivatives produce anesthesia when inhaled, but are too toxic for general use. Hydrofuramide has been proposed as a rat poison and is claimed to be non-toxic to domestic animals. Barbituric acid and hydantoin derivatives of furfural are the subject of many foreign patents issued within the past four years.

In very recent literature attention has been given to furyl substituted cinchonic acids, such as the furyl analog of atophan.

Furfural is said to be a good bait for the Oriental fruit moth, and it has been used to prevent infection of dehorned cattle by the screw worm fly. As a wash in poultry houses to kill lice and other parasites it is as effective as formalin and is easier to handle. Embalming fluids for human beings and biological specimens are made with furfural.

Other uses in these fields have been proposed, but the applications mentioned are enough to warrant the statement that further research in the biological application of the furans should prove fruitful. At present probably less than a ton of this aldehyde is used annually for such purposes, and while this quantity is only a fraction of the present market, nevertheless, its importance should not be minimized.

The uses of furfural involving its chemical properties are more promising as far as large outlets are concerned. Its aldehydic nature suggested its use in phenolic resins, and for many years synthetic resin manufacture consumed more than 50 per cent. of the furfural produced. Phenol-furfural resins are superior to the formaldehyde analogs in some respects, being particularly good from the standpoint of heat-, acid-and alkali-resistance, mechanical strength, and electrical properties. From the yield standpoint furfural also offers advantages. When 96 lbs. of furfural and 94 lbs. of phenol react, only 18 lbs. of water is lost, whereas about 80 lbs. of formalin and 94 lbs. of phenol liberate 68 lbs. of water. At present furfural resins can be made more cheaply than formaldehyde resins. It is probably also true that if furfural resins were to receive one-tenth the research effort expended on formaldehyde resins tremendous and rapid advances in this field would be made. In at least one case furfural-phenol resins enjoy a practical monopoly, and that is as a cement to seal electric light bulbs to the brass bases. Most of the light bulbs in the world today are made in this manner.

Numerous other resins have been made from furfural and its derivatives. Thus furfural and furfuryl alcohol resinify with acids to form insoluble products, and this reaction affords an excellent means of impregnating porous materials with subsequent formation of a resin *in situ*. One patent suggests the use of furfural with seaweed to form resins, another describes use of the resin obtained on evaporation of furfural as a coating composition for copper wire, and still others the applications of furfuryl methacrylate resins.

Furfural may be oxidized to maleic acid which is used in the manufacture of alkyd resins. Lignin-furfural resins are also being investigated as a source of low cost pre-fabricated building materials and as the cost of furfural decreases, the uses in these fields will become increasingly attractive.

Recent literature describes ice colors, cyanine, and alizarin type dyes from furfural as well as the furan analogs of Malachite green, benzoflavine, and rosamine.

Years ago the lead and zinc salts of dithiofuroic acid were used as vulcanization accelerators. This market disappeared, but in the past few years the number of patents issued, describing accelerators made from furfuryl amines, tetrahydrofurfuryl, amines, mercaptobenzothiazole derivatives of furfural and similar materials, indicates renewed interest in this field. Furfural, hydrofuramide, and furil have been used as anti-oxidants in the rubber industry.

The solvent uses of furfural may be divided into two fields; first, where simple solution is desired and second, where selective solvent action is needed. Furfural, furfuryl alcohol, and tetrahydrofurfuryl alcohol are solvents for cellulose esters, vinyl compounds, many natural gums, and phenolic resins and in general for substances of an aromatic character. For years, resin-bonded abrasive wheels have been made with furfural as the solvent, and lately furfuryl alcohol has come into the same field. Paint removers, lacquer solvents, and special high boiling solvents have been formulated from furfural, furoic acid esters, and other derivatives. Esters and ethers of furfuryl and tetrahydrofurfuryl alcohols are said to be excellent plasticizers. A special case is terpene furoates which have been described within the past two years.

Furfuryl alcohol was used as a carbon remover in internal combustion engines, but this use was discontinued not because a better solvent was found but because of the difficulty in storing

the alcohol under the high-temperature conditions under the hood of an automobile.

Many textile and industrial dyes are soluble in furfural. Certain arsenic compounds useful for preventing attack by termites and Teredo may be carried into the wood with furfural as the solvent. Difficultly soluble compounds are frequently dispersed in tetrahydrofurfuryl alcohol. Use of this solvent for therapeutic agents is awaiting more accurate data on the toxicity of the solvent. Another use based on the solvent properties of the furans is in the refrigerating industry.

A number of years ago it was found that anthracene could be separated from phenanthrene and carbazole by the selective solvent action of furfural. The same solvent will remove the color bodies from crude wood rosin. This process has revolutionized the wood rosin industry within the past ten years. Naphthenes, sulfur compounds, aromatics, and other undesirable constituents of oil are removed with furfural. The national advertising campaign of one large oil company is based on the fact that its motor oil is purified with furfural, a solvent made from farm products. More oil is being refined today with furfural than by any other selective solvent. One of the latest installations of a furfural solvent refining unit is designed for treatment of Diesel fuel. A considerable improvement in the Diesel index and the ignition quality of the fuel is attainable through use of this solvent. Tall oil, linseed oil, tung oil, and many types of organic crudes may be at least partially separated or refined with furfural or furfuryl alcohol. This field constitutes the largest outlet for the furans today, and the end is not in sight.

Miscellaneous uses for furfural cover a multitude of industries. Textile wetting agents made from tetrahydrofurfuryl alcohol are common in Europe. It may be used as a pulping agent in the manufacture of paper. Patents have been issued claiming it is useful as a motor car and airplane fuel. Furfuryl alcohol and tetrahydrofurfuryl alcohol are mentioned in the patent literature as being excellent anti-freezes. Furfuryl xanthate is an excellent flotation agent, and at one time it appeared likely that several tons per day of furfuryl alcohol would be used for making the xanthate. Furoic acid is said to be a good anti-scorch in rubber manufacture. Furfural is applied in the preparation of certain anti-creasing compositions. It is used as a demulsifying agent for oil mixtures, and its derivatives serve as emulsificants and degreasing agents in the textile field, according to other patents. Improvement in "oiliness" of hydrocarbon lubricants is claimed through addition of a furoic acid ester to the lubricant.

A very interesting and potentially large outlet for furfural is in the building of bituminous roads. Furfural alone, or a mixture of furfural and phenol or furfural and aniline is added to a mixture of bitumen and mineral aggregate. First, this addition results in better wetting action of the bitumen for the aggregate; second, the adhesion is increased. It is also probable that subsequently a resinous film is formed which helps increase the weathering resistance of the bituminous surface. On an average it requires about one ton of furfural per mile of road. A real need exists for improvements in this field, and if future experiments check the results already obtained furfural will be used in the construction of many miles of secondary roads.

From lubricating oils to abrasive manufacture and from anesthetics to road building there is practical and theoretical evidence of the value of the furans as industrial products. Two great factors militate against the fruition of many of these projects, price and lack of adequate research. Of these the economic factor is of least importance for with sufficient volume furfural can be made at an unbelievably low cost. Research is increasing. A prominent American chemist has predicted that within twenty-five years furan chemistry will be as well established industrially as benzene chemistry. While this may seem an exaggeration, it may be closer than many of us realize.

Study of Plasticity

By Paul S. Roller
U. S. Bureau of Mines Experiment Station

A NEW approach has now been made that treats the behavior of dispersions as that of solids rather than liquids. It has been found that under a compressive force dispersions undergo a permanent deformation, and that this deformation does not commence until a certain stress, the yield value, has been exceeded. This behavior is characteristic of the solid state of matter.

Measurements of the relation between the force and deformation, or extent of plastic flow, have been made on many different materials. As a result, a simple law has been discovered that applies to all dispersions. On the basis of this law it has been found possible to characterize numerically the properties of plasticity and cohesion. It turns out that these properties are closely related, but exceptions occur.

The solid-like character of dispersions is explained by the existence of a rigid network resulting from mutual attraction of the dispersed particles. It has been concluded from experiment that plasticity and cohesion are greater, the greater the force of attraction between the particles.

Alcohol from Farm Products

By Burke Jacobs
Bureau of Chemistry & Soils

IN this country we had originally a large part of the world's supply of petroleum, and there has been little indication of approaching shortage or need for replacement fuels. At the present rates of consumption eventually the supply will diminish, with corresponding price advances, and some thought should be given to the situation then to be faced. Whether our petroleum supply will last ten or twenty years is immaterial.

The supply is irreplaceable and conservation should be practiced up to the time when a better source of motive power is developed to the commercial point. Actually use of alcohol motor fuel has mainly been advocated in this country as a farm relief or crop price raising expedient, rather than as a conservation measure and such proposals bring complications into the problem. If high prices are paid the farmer for alcohol materials to increase farm income, cost of the alcohol becomes impractical. Therefore any increase in farm income, from alcohol fuels, must rather come from such portions of crops now unsold or unusable which could be utilized industrially without disturbance to the price structure.

The problem of uncontrolled production of crops and of unsalable surpluses which remain on hand to depress prices has recently been countered by governmental measures tending to restrict crop raising. But besides crop surpluses for which present markets are lacking, great quantities of unmarketable culls and wastes are also produced each year and represent further loss of potential farm income. These materials are scattered over the 6,800,000 farms of the country and are largely uncollectable for industrial use.

Another loss of potential farm income attends the production of quantities of relatively perishable crops which by reason of geographical location or temporarily glutted markets cannot be sold before they deteriorate. In addition, the various crops are classified into several standard grades according to quality, and usually there is difficulty in disposing of the poorer grades. In normal production years crops are usually produced in excess of food market requirements, and some form of industrial utilization to use up any surplus above the normal carryover should be found, especially since export markets have fluctuated. All these constitute an important part of the agricultural problem.

In addition, vast quantities of cellulosic materials, such as cornstalks, straws, sugarcane bagasse, corn cobs, hulls, and shells, which might serve as raw materials for industrial purposes and for motor fuels, are annually produced and largely wasted each year, although representing further potential farm income.

Attempts to control or stabilize agricultural prices by maintenance of a fairly constant surplus would necessitate a means of economically utilizing or disposing of any additional surplus, over the normal supply, in such manner that food or feed prices are not adversely affected. Such use would, however, be necessarily limited by the possible market for the chemical or industrial products made from such crops. Decreased crop production means a relatively larger unit overhead, and increased production might be more desirable if a proper market outlet existed.

At present, alcohol will cost more than gasoline, and this relative difference in cost must be met. Furthermore, use of considerable portions of present crops will advance raw material prices. This may or may not benefit the farmer in the long run, but large-scale use of farm materials for alcohol production will probably keep the cost of alcohol up, because present crops are inadequate for such a program.

Alcohol in motor fuel can be visualized either on the basis of national use of a standardized blend of definite high percentage (10-15 per cent.) as one extreme, or by localized production and irregular use of blends of varying and low concentration as the other. In the latter case the alcohol will likely be produced from such inconstant local supplies of crops as may be securable, in which probably much of the culls, by-products, or temporary surpluses would be absorbed. The amount and cost of such alcohol would both vary widely.

As the other alternative, the production of alcohol in large quantities sufficient to make a ten to fifteen per cent. concentration blend of national scope is not yet possible because on the basis of present crops, the diversion of any great quantity of our crops would result in price increases which would not only raise the cost of the alcohol to impractical levels but would likewise affect food and feed cost.

There has been some discussion on the growing of "industrial" crops, or crops grown in unlimited quantities directly for industrial use. Such crops would perhaps net a lower unit price return, but would permit farm overhead to be distributed over more production units. Whether this will be practical is yet to be proved.

Experimentation has indicated that the average production of various crops might be considerably increased by improved farming methods. New developments with hybrid corn, sweet potatoes, and other crops have indicated that it is possible to increase acre production of these raw materials, at least in the more suitable areas. Raising more crops on the same acreage would mean proportionately increased costs for labor, seed, and fertilization, the last item being perhaps the principal one. On a properly equipped farm, machinery capital expense should not greatly increase, but the machinery would work more hours per year. Crop failures, however, would represent a heavier investment loss than under the present system.

The compromise program, if ever started, will, therefore, have to be that of a slow development of alcohol motor fuel production based first on use of such crop surpluses, culls, and wastes, as may be suitable and available, to produce irregular amounts of alcohol, and necessitating the sale of a blend of varying concentration, which must then be sold in direct competition with cheaper gasoline. Such production may later advance through stages of larger crops or industrial crops on a more and more definite use of motor blends on an enlarging scale.

Once the alcohol-fuel producing system existed, the utilization of present culls and wastes would become far more practical, and these present losses become virtual assets. Use of culls and wastes as motor-fuel raw material will partly reduce required crop acreage increases, although it might slightly increase the alcohol-production costs. The reduction of crop surpluses to alcohol for storage might be possible, if storage charges do not become too serious.

Despite some proposals, an alcohol fuel industry on a large scale could not be brought about for many years, particularly because of lack of processing plants.

Probably the cheapest source of supplementary fuel in the immediate future will be from waste gases (particularly cracking gases of the petroleum industry). There is a limitation to the present supply of such gas and in the future such limitations would depend on the number of cracking plants and the duration of the petroleum reserves. Water gas and natural gas provide other sources.

The fermentation process, using the annually replaceable carbohydrates produced by the interaction of water, sunlight, air and soil, will probably be the next logical source, both from the standpoint of quantities available and of production cost.

As the next practical source, the chemical conversion of wood may be considered, although such chemical conversion may be cheaper or more practical when accomplished as a charcoal-steam blue gas whereby CO + H are obtained. At present, the U.S. wood supply would be inadequate to meet the needs of a replacement fuel supply. Under a program of reforestation, particularly of land inferior for crop raising, some future possibilities may be visualized, since wood is replaceable.

The next possible source would be shale, of which tremendous deposits exist. In this case the cost of extraction will probably be too high in comparison with present motor fuel costs, and a relatively large amount of coal will be required for distillation.

By use of alcohol as motor fuel some petroleum conservation can be achieved, since such use will tend to defer the date of exhaustion of the reserves. As far as the petroleum industry is concerned, this may be an actual benefit, since the life of the industry would be extended. In the last analysis, true conservation of petroleum resources may not consist in holding a reserve below ground untouched for future use. Engines developed in the years to come might use some other form of motor power. Conservation at its best seems to be largely a matter of regulation of output to avoid waste and uneconomic prices, and stretching the supply to the farthest degree compatible with national use requirements.

New Uses for Turpentine and Pine Oil

By Carl P. Speh
Naval Stores Research Division
Bureau of Chemistry & Soils

MENTIONING various uses for turpentine, including shoe, stove, furniture and floor polishes, insecticides and as a solvent for waxes, the present outstanding use for turpentine is as a paint and varnish solvent and thinner. Of these, the most important at the present time is the production of synthetic camphor. Several basic processes are in general use, each based upon the pinenes which compose about 92 per cent. turpentine, as a starting point.

A method for the production of synthetic camphor with pine oil as the initial material, utilizing the borneol present, is being introduced.

Pine oil is valuable as an agent in the flotation of lead and zinc ores, in textile scouring, as a solvent in rubber recovery, as a cleanser, disinfectant, and deodorant.

Pine oil, consisting of terpene alcohols, ketones, esters, phenol ethers and some terpenes, is a product exclusively of the wood naval stores industry. In recent years great progress has been made in separating these various components and

marketing them, each for its particular use. Chief among these are alpha terpineol, anethol, fenchyl alcohol and borneol.

For every pound of turpentine produced, four of resin are made. The bulk of resin consumption is in paper size, soap and varnish. Vast quantities are used in the manufacture of laundry and industrial soaps, protective coatings, varnish, insecticides and germicides, liquid cement, sealing wax, crack fillers, cold-set greases, battery seals, phonograph records, linoleum, shoes, toys, solder tubes and as a depilatory to remove hog bristles and pin feathers from poultry.

One of the high boiling constituents of wood turpentine is dipentene, having a greater solvent value than the pinenes. This is fractionated out and used as a solvent in paints, varnishes and printing inks, where its high solvent power prevents or retards the formation of surface skims in the can before use.

This has been a rather brief review of some of the more important present uses of these naval stores products. With the exception of the production of synthetic camphor and of ester gum, in which the chemical nature or molecular structure undergoes definite change, there has been little change in the industrial utilization of resin and turpentine since the early days of the industry.

However, with knowledge of the components of the crude oleoresin from which turpentine and resin are produced and of the fundamental composition of turpentine and resin themselves, as well as the effect variations in methods of production have on the physical and chemical properties of these components, new uses will be developed.

New Synthetic Rubber

Polish scientists have discovered a new process for the manufacture of synthetic rubber, the cost of production of which is no higher than is the cultivation of the natural product. The new material, according to *Rubber Age,* Sept., 1938, p. 380, has been named "Ker." It will withstand a temperature of 60° C. without losing any of its properties.

Milk Treatment Process

A method of treating milk to keep it sterile and fresh at room temperatures without spoiling, for as long as three or four months, has been patented by Joseph R. Reichert and Robert W. McAllister, research chemists in a Wilmington, Del., laboratory. Process involves adding a small amount of hydrogen peroxide and potassium iodide to the milk, then heating it. There is no change in taste, inventors say. The potassium iodide supplies iodine to the milk, thus making it a valuable source of iodine for persons suffering from iodine deficiency. New method suggests possibilities beyond that of pasteurization.

Special Grade of Silica

A special grade of dehydrated micro-amorphous opaline silica prepared from diatomaceous earth is being marketed by New Hampshire Diatomite Co., Portsmouth, New Hampshire, under the trade name "Paratex." New material is designed for use as a filler and reinforcing agent in rubber, asphalt, and similar compositions.

Paratex has a specific gravity of 2.27 and 90 per cent. will pass a 325-mesh sieve. It is neutral in tone and can be used in stocks of any color. It does not contain any ingredients that are detrimental to the aging qualities of rubber and does not affect the rate of cure. Its chemical analysis reveals silica, moisture, alumina, iron, lime, magnesia, titanium, alkalies and sulfates. There is only a trace of titanium and sulfates.

One of its outstanding properties is great surface hardness. Since Paratex is neutral in color, it takes only a small quantity of titanium dioxide to give a good white and white stocks of great hardness can thus be produced. (*Rubber Age,* Sept., 1938, p. 362).

Aluminum Salts for Water Repellents

In order to provide a highly concentrated source of soluble aluminum for water repellent treatment of textiles, Niacet Chemicals Corp., 4702 Pine Ave., Niagara Falls, N. Y., offers two new soluble aluminum acetate salts under the tradenames, Niaproof and Niaproof B. Niaproof* contains 37 to 39 per cent. alumina as Al_2O_3 and dissolves readily in water to form solutions of any desired concentration. The pH of these solutions, an important factor to consider when compounding any aluminum salt with wax emulsions, varies from 5.1 at 32 per cent. concentration to 5.4 at 1 per cent, concentration. If solutions of lower pH are desired, the addition of small amounts of glacial acetic acid will give solutions as low as pH 3.6. Niaproof B is a more basic type of aluminum acetate salt containing 35 per cent. alumina as Al_2O_3. Solutions are prepared by dissolving in almost boiling water with violent stirring. Such solutions have a pH range of from 4.7 at 32 per cent. concentration to 4.8 at 1 per cent. concentration, and lower values may also be secured by the addition of glacial acetic acid.

*Trade-mark

Hosiery Rubberizing Process

Wearing qualities of British hosiery are said to be considerably increased by means of a new process of treating finished hosiery with a solution derived from latex. Main features of the Duran Process, as it is known, consist in the application of a solution containing colloidally dispersed rubber hydrocarbons and other ingredients to the finished hosiery, after which the hosiery is dried and submitted to a finishing treatment. The solution is applied to the toe and heel areas, where the wear is greatest, and produces a marked strengthening effect attributed to the combination of the rubber hydrocarbons with the fibres constituting the wool thread. Appearance and feel of the sock are not affected. (*Rubber Age,* Sept., 1938, p. 370).

Insulating Material from Pickling Liquor

A process has been developed by H. Seymour Colton, Cleveland, whereby waste pickling liquor is transformed into a building material, said to have remarkable insulating properties. Process, controlled by Allied Development Corp., Cleveland, is simple and inexpensive. Material is largely a co-precipitated iron oxide and calcium sulfate, and has been named Ferron. During its manufacture it goes through a stage where it is perfectly plastic and can be molded into any desirable shape, later setting to a hard, rigid mass by a combined process of drying and oxidation. After drying and setting, material is tan in color and extremely porous. Ferron resembles wood in many respects, but it is said to be fireproof, termite-proof, and warp-proof. It is somewhat like plaster but has 550 per cent. the insulating value of plaster-made products and also will stand a much higher temperature without losing its strength. It is similar to fired clayware such as brick, except that it weighs only one-third as much and will cut, saw and machine perfectly. An inch-thick slab is said to have an insulating effect equal to as much as 15 in. of brickwork.

Several uses have already been developed for Ferron. One of them is wallboard. As a pipe-covering, it has about the same insulating value as 85 per cent. magnesia, but is much stronger and will insulate at a higher temperature (900° F. instead of 600° F.) without losing its strength.

Ferron presents a new material for chemical purposes. It removes hydrogen sulfide and other sulfur compounds from gases and liquids. Silver kept in boxes or on slabs of Ferron will not tarnish. It is an ideal filter medium for many operations. Tests now being conducted indicate that it can be used agriculturally as a soil conditioner and secondary fertilizer.

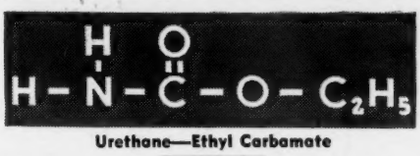
ADVERTISEMENT—*This entire page is a paid advertisement.*

Prepared Monthly by the U. S. Industrial Chemical Co., Inc.

SOLVENT NEWS

Reg. U. S. Pat. Off.

October ★ A Monthly Series of Articles for Chemists and Executives of the Solvent-Consuming Industries ★ 1938



Urethane—Ethyl Carbamate

Says Carbamates Improve Properties of Hair Dyes

WASHINGTON, D. C.—New hair dyeing assistants, described in a patent issued here, may make scores of dyes formerly regarded as unsatisfactory, perfectly suitable for dyeing human hair. Specific examples of the materials which are said to promote contact between dyes and the hair include: methyl-carbamate, phenyl carbamate and ethyl carbamate (urethane).

When urethane, for example, is used in proportions varying from 19 to 25%, dyes are said to adhere better, produce a faster and more permanent color on the hair, and may be used at a lower temperature. For blond hair the inventor suggests the following formula to be dissolved in 89 parts of water:

Urethane .....10 parts
Cupranil Brown (C.I. No. 560) .... 1 part

Among the scores of dyes which can be used in accordance with the invention are many which are in themselves non-irritating to the skin and non-poisonous to the human body, the inventor emphasizes.

[Urethane is now available in limited quantities from small scale operation. Samples may be secured for experimental investigations from U.S.I.]

High Voltage Transforms Dibutyl Phthalate to Oil

ELIZABETH, N. J.—How dibutyl phthalate and other alcohols and esters may be transformed into an excellent lubricant by subjecting it to a high voltage electrical discharge is revealed in a patent granted two inventors here. The electrical discharge polymerizes the dibutyl phthalate and produces an unsaturated and unstable polymer which is stabilized by hydrogenation, according to the inventors.

They report that oils prepared by this process may be used directly as lubricants, or may be blended with other oils to improve the properties of the latter. In a specific example given in the patent, dibutyl phthalate was subjected to silent electric discharge at about 8,000 volts, 60 cycles, 5-20 mm. vacuum, and room temperature for several hundred hours. After this treatment, it was found that the viscosity at 100° F. had increased from 57.5 sec. to 167 sec. and the viscosity at 210° F. had gone from 34 sec. to 43 sec. The iodine number was found to be 11.3 and the acid number 29.72.

Alcohol Aids Determination Of Trichlorethylene in Air

CAMBRIDGE, England—Ethyl alcohol is used for the rapid determination of trichlorethylene vapor in room air, in a new method described here. The trichlorethylene in a known volume of air is absorbed in a definite volume of alcohol through which the air is passed. An aliquot of the resulting solution is burned in a lamp and the vapors from the lamp are passed through a solution containing a known amount of silver nitrate which reacts with hydrochloric acid, etc. After absorption, the excess silver nitrate is titrated with potassium thiocyanate.

Solox Lowers Cost and Speeds Production in Many Industries

New Uses for U.S.I.'s General Solvent Include Manufacture of Special Lacquers, Varnishes, Adhesives, Cleaning Fluids, Etc.

Continuing its rapid expansion in diversified fields, Solox, U.S.I.'s proprietary alcohol-type solvent, made numerous gains on all fronts during the past few months. In addition to replacing other alcohol products in many long-established solvent uses, it won adoption in the manufacture of many new developments, ranging from dry cleaning fluids to adhesives for laminating metal foil to cellophane.

Solox consists essentially of 100 parts of S.D. alcohol No. 1, to which is added 5 parts of ethyl acetate and one part of aviation gasoline. Ethyl Acetate is a most effective organic solvent and has the unique property of bringing out the latent solvent power of the alcohol. It, therefore, not only contributes its own solvent power, but makes the mixture more efficient than either component alone.

Aids Lacquer Formulation

In the newer lacquer formulations, Solox has become a very important tool. For example, manufacturers of cellulose acetobutyrate lacquers have found ethylene dichloride and Solox to be one of the most useful solvent mixtures. Since the ethyl acetate in Solox is a solvent for cellulose acetobutyrate, the mixture has the virtues of economy and compatibility.

Recent studies have shown that 20% Solox with 80% toluol is one of the most powerful solvent combinations for ethyl cellulose. This mixture gives low viscosity solutions and superior final films.

Further illustration of the variety of formulations into which it has recently entered is the use of Solox in ethyl cellulose-Pontianak spirit varnishes. One reason for this application is the widespread use of Solox as a resin solvent.

Apart from the employment of Solox in ethyl cellulose lacquers is its use in ethyl cel-

(Continued on next page)

U.S.I. Acquires Business of Stroock & Wittenberg Corp.

Supplements Present Business In Resin Industry

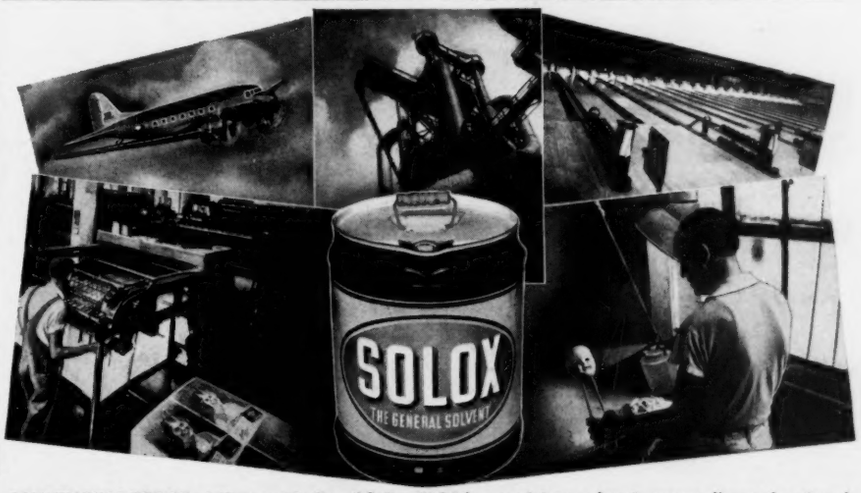
U. S. Industrial Alcohol Co., which recently entered the synthetic resin industry, through the acquisition of the business of Robert Rauh, Inc., announces that it has supplemented this business by the acquisition of the business formerly conducted by Stroock & Wittenberg Corporation, consisting of selling natural and synthetic resins and importing natural resins.

The resin business of U. S. Industrial Alcohol Co. in its entirety will be conducted through a new corporation entitled "Stroock & Wittenberg Corporation" from the office of that Corporation at 17 Battery Place, New York City, under the personal direction of the Corporation's President, Mr. A. J. Wittenberg.

Drug and Chemical Mfrs. To Meet October 21 and 22

The Drug, Chemical and Allied Trades Section of the New York Board of Trade will hold its Third Annual Fall Meeting and Gold Tournament on October 21st and 22nd, 1938. Complete details of the business and recreational activities are to be announced later. The meeting will be held at the Skytop Club, Skytop, Pennsylvania.

U.S.I.'s General Solvent Enters New Fields



CONVINCING PROOF of the superiority of Solox, U.S.I.'s proprietary solvent, over ordinary denatured alcohol is its rapidly expanding use in diversified commercial fields. Stronger solvent power, compatibility, and low cost are only some of the factors which lead Solox into the manufacture of so many recent developments, including new Lacquers, Varnishes, Adhesives, Cleaning Fluids, etc.

ADVERTISEMENT—*This entire page is a paid advertisement.*

October ★ **SOLVENT NEWS** ★ 1938

Solox Cuts Cost and Speeds Production In Numerous Industries

(*Continued from previous page*)

lulose adhesives which promise to become important bonding materials. These quick-setting adhesives have already found many special applications, such as laminating paper, cloth, cellophane, cellulose acetate, metal foil to cellophane, etc.

Its solvent power and mild inoffensive odor make Solox the ideal solvent for cutting and thinning shellac. Where exceptionally smooth and lasting finishes are required, as for example, on bowling alleys, it is frequently specified exclusively.

Non-corrosive Qualities

Principally because of its greater solvent power and non-corrosive qualities, Solox is the preferred solvent for cleaning watches, jewelry, electrical equipment, etc., and in dry cleaning fluids.

The non-corrosive properties of Solox have much to do with its application in two other fields. To prevent the formation of ice on airplane propellers practically all U. S. airlines specify a solution consisting of 15% glycerine dissolved in 85% Solox, which is fed from a reservoir tank into a small trough around the hub of the propeller.

Corrosion must also be guarded against in fluids for duplicating machines. Solox is used here to dissolve the aniline dye on the master copy.

In another comparatively new duplicating process, a solution of Solox and diethyl phthalate makes ordinary paper translucent for blue-printing. With this process any number of clear, distinct copies can be made at a cost much less than photostating.

Excellent Fuel

Because Solox burns with a colorless flame, without objectionable odor and is clean and inexpensive, it is the preferred "alcohol-type" fuel for torches, chafing dishes, and portable stoves. One manufacturer of alcohol-burning torches and halide gas detectors recommends Solox exclusively for his equipment.

Anhydrous Solox continues to find increasing application both as a solvent and as a chemical. In many of the developments described above, as well as in older applications, water-free Solox is found to speed certain reactions and frequently to give higher yields. Because of its mild odor, Anhydrous Solox finds particular favor in products which must be applied in confined or public places.

Except for bulk shipments, no permit is required covering the sale of Solox for solvent and manufacturing purposes.

Other properties and applications of this outstanding solvent are described in a leaflet, "Solox, The General Solvent," available without charge from U.S.I.

Credit Acetic Acid With Toxic Effect On Molds

Acetic and other innocuous fatty acids of this series have a remarkable toxic effect upon the growth of bread molds, it is revealed in a recent article. The pH must be kept low, however, since at pH values from 5.5 to 6.0 the acids have only a slight effect, the authors warn. It is believed that successful application of the principle to other than food or bakers' products is possible.

Bactericidal Paints By Mixing Essential Oils?

The manufacture of bactericidal paints based on recent studies of the antiseptic value of combined essential oils, is under discussion in Italy, according to a recent report, Some time ago J. Risler, a German chemist, pointed out that mixing essential oils of different volatility lengthens their antiseptic value to about four years as compared with a few days when the oils are used separately. (See Alcohol News, July, 1937.) Italian paint chemists are now wondering whether adding some mixtures of essential oils might not lead to the development of new bactericidal paints, the report states.

Hungry Little Yeasts

Specially selected yeasts used in the production of industrial alcohol from molasses have an enormous appetite. In two days the three tons of yeast in one large commercial fermenter, convert 75 tons of sugar. To equal this rate, a 140-pound man would consume about 1,750 pounds of sugar per day.

TECHNICAL DEVELOPMENTS

For further information, write to U.S.I.

A durable, water-repellent finish for cotton, linen and rayon fabrics, reported recently, is said to resist frequent dry cleaning and laundering. Treated fabrics resist spotting and staining and are improved in appearance, drape and handle, the report states. **(No. 141)**

U S I

A new insect repellent having practically no odor is said to retain its effectiveness 2½ times as long as oil of citronella. In recent tests, the fluid repelled mosquitoes and house flies unfed for 24 hours, the manufacturer reports. **(No. 142)**

U S I

A new automatic marker is said to provide free flowing, smooth marking on packages, cartons, drums, paper, cloth, leather, etc. An indelible, waterproof and quick-drying ink is available, according to the manufacturer. **(No. 143)**

U S I

A new wood filler remains free to wipe 30 minutes after application and yet may be coated with sealer or shellac within two hours, according to the manufacturer. With this material, large pieces may be filled before the filler has dried too hard to wipe, it is claimed. **(No. 144)**

U S I

Transparent cellulose acetate wrapping material which generates much less static electricity than similar materials, was announced recently. According to the manufacturer, the material is proof against water, grease, dust and vermin, is unaffected by atmospheric changes and will not dry out with age. **(No. 145)**

U S I

A new quick-drying primer may be handled 3 minutes after application and recoated with a top coat within 10 minutes, the manufacturer reports. The primer is said to have exceptional rust inhibiting properties and to be especially suitable for hot- or cold-rolled steel, cadmium plating, zinc die castings, etc. **(No. 146)**

U S I

A new water-white belt dressing has neutral characteristics and contains only ingredients which pass U.S.P. standards, the manufacturer announces. **(No. 147)**

U S I

Coloring and preserving concrete by a new method is said to produce beautifully colored floors which are lime-proof, sun-resisting, oil-proof and generally stainproof. The system consists of a penetrating color and a dressing which fixes the dye, protects it from wear and produces the polish, a recent announcement states. **(No. 148)**

U S I

For measuring particle sizes below 325 mesh (44 microns), the device at left affords amazing accuracy as well as speed and ease of manipulation with low first cost, a recent announcement states. This particle size gives accurate results in about two hours from representative samples of less than five grams, the manufacturer maintains. **(No. 149)**

U.S.I. INDUSTRIAL ALCOHOL CO.
INDUSTRIAL CHEMICAL CO. INC.

WORLD'S LARGEST PRODUCERS OF ALCOHOL DERIVED SOLVENTS

Executive Offices: 60 East 42nd Street, New York, N. Y. Branches in all Principal Cities

AMYL ALCOHOLS
Refined Amyl Alcohol
Refined Fusel Oil
Secondary Amyl Alcohol

ETHYL ALCOHOLS
Specially Denatured
Completely Denatured
Anhydrous Denatured
Absolute—Pure
C.P. 96%—Pure and Denatured
Pure (190 Proof)—Taxpaid, Tax Free

*SOLOX—The General Solvent
*SUPER PYRO—The premium Quality Anti-freeze

SYNTHETIC RESINS

BUTYL ALCOHOLS
Normal and Secondary

ISOPROPYL ALCOHOL

METHYL ALCOHOLS
95%, 97% and Pure
METHYL ACETONE

ETHYL ETHER
U.S.P. and Absolute (A.C.S.)

COLLODIONS
U.S.P., U.S.P. Flexible and Photo
NITROCELLULOSE SOLUTIONS

DIAMYL PHTHALATE
DIBUTYL PHTHALATE
DIETHYL PHTHALATE
DIMETHYL PHTHALATE

ACETIC ETHER
AMYL ACETATES
High Test Commercial
Technical Secondary
BUTYL ACETATES
Normal and Secondary
*DIATOL
DIETHYL CARBONATE

ETHYL ACETATES
85-88%, 95-98%, 99% and U.S.P

ETHYL LACTATE
ISOPROPYL ACETATE
AMYL PROPIONATE
BUTYL PROPIONATE

ANSOLS
Ansol M Ansol PR

ACETOACETANILID
ACETOACET-O-CHLORANILID
ACETOACET-O-TOLUIDID
ETHYL ACETOACETATE
SODIUM ETHYL OXALACETATE
PARACHLOR-O-NITRANILINE

ACETONE
DIBUTYL OXALATE
DIETHYL OXALATE
ETHYL CHLORCARBONATE
ETHYL FORMATE
ETHYLENE
URETHANE

*CURBAY
POTASH BY-PRODUCTS

*Trade-mark registered

Scouring and Processing Agent

A synthetic scouring and processing agent of I.G., manufactured under the name of Igepal C., is announced by General Dyestuff Corp., 435 Hudson st., New York City.

It is recommended for scouring and processing cellulose fibers. The outstanding properties of the product, apart from its superior cleansing or detergent powers are: excellent wetting out; resistance to hard water and the metallic salts encountered in textile processing; prevention lime soap; not hydrolyzed by water, and easily rinsed out of fabrics.

Chlorine in Cheese Manufacture

Recommendations for the sterilization of cheese factory equipment and utensils with chlorine preparations to overcome the so-called "utensil flavor" in cheese are embodied in a recent communication from the State Department of Agriculture and Markets, based upon the published results of scientific findings carried on at the Geneva, N. Y. Experiment Station.

In experiments conducted at the Station, it was found that use of a simple, inexpensive chlorine solution was very effective in making good cheese by keeping the equipment sweet.

New Uses for Salt

The Forest Products Laboratory, U. S. Dept. Agriculture, is conducting research on salt seasoning of lumber, and several Southern mills are using the process experimentally with favorable results in drying time and drying defects, according to *Chemical Trade Journal,* Aug. 26, 1938, p. 186. The Bureau of Chemistry and Soils, after experimenting with salt in the treatment of vegetable-tanned leathers used for bookbindings and other fine leather, concludes that the resistance of vegetable-tanned light leathers to acid rot from atmospheric pollution and, consequently, the useful life of these leathers can be greatly increased by the simple expedient of incorporating from 2.5 to 5 per cent. sodium chloride.

Nickel Alloy

"Z" Nickel, new nickel alloy introduced by International Nickel Co., 67 Wall St., New York City, which, in addition to possessing the mechanical properties of high strength alloy steels, has the corrosion resistance of nickel, is said to contain 98 per cent. nickel. Alloy has a strength of from 2½ to 4 times that of ordinary structural carbon steel. It has been produced with a tensile strength as high as 250,000 psi and hardness values as high as 46 Rockwell C. In its unhardened or annealed condition, it fabricates almost as easily as pure nickel. Such operations as bending, drawing, machining, and hot forging are accomplished readily. The metal can be heat treated after fabrication with little if any distortion since heat treating operations are carried out at low temperatures—890° F. to 930° F. for 6-16 hr.

Ferric Sulfate for Treatment Laundry Waste

Studies at the Lawrence Experimental Station, Mass. Dept. Health, showed that laundry wastes discharged into small rivers during the warmer months of the year may deplete the dissolved oxygen to such an extent that offensive conditions will occur. Such wastes contain a relatively large amount of soap, which tends to clog filters. Tests at the Station prove that these wastes can be clarified and most of the objectionable organic matter removed by precipitation with ferric sulfate, and the sludge satisfactorily dried on sand beds. The average B.O.D. of a number of samples of these raw wastes was 390 p.p.m. After coagulation and sedimentation the clarified wastes had a B.O.D. of only 52 p.p.m., a reduction of about 87 per cent. This treatment converted the laundry wastes from very soapy turbid liquids to clear ones, which will not seriously affect the river during the warmer weather. (*Water Works and Sewerage,* Sept., 1938, p. 886).

Rust Preventive

A patent for a rust preventive consisting of sodium chloride, chromic and cresylic acids, has been obtained by Clete L. Boyle, Detroit. After solution has been applied to iron or steel any kind of paint can be used. (*Drugs, Oils and Paints,* Sept., 1938).

Phenol in Vanillin Synthesis

A new method of vanillin synthesis now being operated by the Russian perfume industry is understood to utilize phenol as starting material, according to *Chemical Age,* Sept. 17, '38. p. 221.

White Lead Process

A process for manufacture of white lead, the basis of D.R.P. 652,445, depends upon the treatment of finely divided litharge in a suitable closed apparatus, for instance a ball mill, with aqueous ammonia solution, and then subjecting the mixture while the ball mill is in operation to the action of ammonia gas and carbon dioxide under pressure and at elevated temperature. In a recommended modification, the litharge is first mixed with water into a stiff paste, and aqueous ammonia and carbon dioxide introduced. Ammonium carbonate solution can also be used for the preparation of the original litharge paste, this modification speeding up the process. The ammonia evolved in the process is recovered. One of the main advantages of the method is stated to reside in the fact that the finished white lead is produced in a state of extremely fine sub-division. *Chemical Trade Journal,* Sept. 2, '38, p. 206.

Month's New Dyes

General Dyestuff announces: Immedial Bordeaux 3BL, a new sulfur dyestuff which produces bordeaux shades of a clarity not previously obtained with sulfur dyestuffs. It can be delivered free from copper and manganese. Fastusol Scarlet LGG is a new direct color which is distinguished by its high fastness to light. It yields a yellowish shade, which in fastness to water, washing and perspiration is superior to the red dyestuffs in this range. Acid Anthracene Brown LE is a chrome dyestuff distinguished by its numerous uses and particularly good fastness to light. Due to its very good fastness to light as well as to water, washing, milling and decatizing, it is most suitable for production of brown and mode shades of best fastness to wearing and processing on loose wool and slubbing. In fastness to carbonizing it behaves very favorably.

Artificial Silk

A new artificial silk, superior to natural silk or any synthetic rayon in its fineness, strength and elasticity has been patented by the late W. H. Carothers, du Pont chemist.

Completely synthetic in their origin, the new fibers can be easily drawn to a size only one-tenth the diameter of a natural silk filament, or in the extreme case, to only one-seventy-fifth the diameter. Yet it shows a tensile strength equal or better than that of silk. In some cases the fibers are 150 per cent. stronger than silk. A remarkable property of the new fibers is the ability to stretch them up to 700 per cent. and thus create permanently an almost complete alignment of the material. The excellent recovery of the fiber, after stretching, makes it especially useful in the preparation of knitted wear, such as stockings, gloves, sweaters, underwear suits, etc. In the light of the fiber's rivalry with natural silk, it is significant that stockings are mentioned first in this list of applications of the fiber. While the fibers have a luster like silk, it is easily possible to treat them and reduce or destroy this luster, the patent states. Zinc oxide and carbon black are among the best known of these delusterants. Eight specific ways of creating the new fibers are described. A typical reaction is a mixture of 14.8 parts of penta-methylene-amine, 29.3 parts of sebacic acid and 44 parts of mixed xylenols.

Chemical Specialties for Industry

A digest of new uses and new compounds

Termite Control and Wood Preservation

By Benjamin Levitt

THE damage done to property by termites, has been estimated by one authority to exceed $40,000,000 per year. Infestation of termites, or white ants, occurs quite generally all over the world, but it is more evident in tropical and subtropical climates. These insects which damage woodwork and other cellulosic materials are divided into two main classes, but there are 58 species in the United States.

The first, and most destructive, are the subterranean termites (*Reticulitermes flavipes*) which live below the ground, and require considerable moisture for their existence. They destroy foundations of houses, fence posts, telephone poles and, in fact, any wood that comes in contact with the ground.

The second is the non-subterranean termite (*Kalotermes Sp.*) which attacks wood directly and does not need so much moisture for its sustenance. It attacks furniture and even trees, entering through scars, borer holes, or under loose bark.

The termite is said to be able to penetrate lime mortar, masonry of brick and stone, tar asphalt, poisoned paint, roofing felt and cracks in concrete, but fortunately cannot pierce solid concrete, nor does it attack wood treated under pressure with effective preservatives.

There are three stages in the life of the termite—the egg, nymph or young, and the adult. There are two kinds of adults—sterile and fertile. The sterile adults of the subterranean termite are themselves divided into two castes—the soldiers, who protect the king and queen from their enemies the true ants, and the workers, who are blind, who do the boring and provide food for the others. The fertile or sexual adults include the normal forms. The wingless sterile workers are the most destructive. They do all the excavating for the colony.

At certain seasons, either spring or summer, depending on local conditions and species, the winged sexual types migrate, lose their wings, lay eggs and form new colonies. It is during these migrations that they are capable of traveling great distances which accounts for their wide distribution.

Out of doors, the egg-laying occurs only during warm weather, but indoors, where the insect is constantly protected, egg-laying may continue throughout the year.

Wherever possible, all wood should be eliminated from foundations, cellars and porches, where it might come in direct contact with the ground. Masonry and concrete should be used instead. Where supporting posts must be used in or within 18 inches of the ground, they should be previously treated with a preservative which will repel termites. Timbers may be further protected by shields of non-corroding metal or alloy. Some exterminators even smear the metal shields with poisoned adhesive so as to prevent any possibility of the insects bridging their tunnels from the ground to the wood above the shield.

A number of chemicals are useful in the control of these insects. Zinc meta arsenate (patent process Curtin-Howe Corp.); 10 per cent. sodium arsenite solution; one part creosote and 3 parts kerosene; carbon disulfide emulsion. The last three treatments are used on soil which has been plowed up previously. Orthodichlorobenzene, at the rate of one gallon per 10 linear feet of ground, is useful for the treatment of post holes and foundation ground to temporarily arrest termite damage. These materials kill insects already in the ground, so that any buildings placed thereon will be reasonably safe provided treated timbers are used.

Where non-subterranean termites are encountered, zinc chloride and chlorinated naphthalene are effective preservatives. Saturating infested wood several times with orthodichlorobenzene kills insects, but where this is impractical, dry Paris green or sodium fluosilicate blown, by means of bellows, into borer holes, or holes bored with an auger, proves helpful.

Where termites have attacked a growing tree, they may be exterminated by digging a trench around it, pouring carbon disulfide or carbon tetrachloride therein and covering up with loose earth. Sometimes tree surgery is effective. The damaged wood is cut away to within an inch of the live sapwood, and the dead heart-wood is given a brushing with coal tar creosote.

Greenhouses may be sprayed with kerosene nicotine oleate or a 5 per cent. kerosene emulsion made up as follows: Dissolve half a pound of fish oil soap in one gallon of hot water, add slowly, while stirring, two gallons of kerosene to emulsify, and dilute with 37 gallons of water.

Calcium cyanide, which mixes readily with earth and serves to fertilize it, is an effective insecticide, but it should not be placed too near living plants because it gives off poisonous HCN gas.

One firm, which claims to do a very thorough job of termite extermination, fumigates the entire house from attic to cellar with a toxic gas combining pyrethrum, nicotine, cresylic acid and derris. They also use orthodichlorobenzene, copper arsenate arsenite, and boil the soil with arsenious acid.

The Western Pine Association recommends the Permatol formulas covered by U. S. Pat. Application No. 93,121. They are as follows:

Permatol A. Treating Solution. Pentachlorphenol 5 lbs.; non-volatile solvent 5 lbs.; special fuel oil 90 lbs.

Permatol B. Pentachlorphenol 2½ lbs., and tetrachlorphenol or 2-chlorophenylphenol 2½ lbs., pine oil or other solvents one gal., spreader 1¼ gals., penetrant 10¾ gals.

Permatol C. Same as Permatol A except for the toxicant which is tetrachlorphenol.

Permatol D. 2-chlorothophenylphenol ⅓ gal., spreader 1 gal., penetrant 8 gallons.

NOTE: The penetrant is Stoddard Solvent or equal, and the spreader is Kerosene or Nos. 2 or 3 fuel oil.

One of the merits of these formulas is that following submersion for 3 minutes, the treated wood may be painted 24 to 48 hours after removal from the solution.

This Association recommends the inclusion of 15 to 30 per cent. linseed or tung oil in the formula to improve the water repellent properties of the preservative.

The Western Pine Association sets forth the following requirements for effective preservative on sash, door and frame stock: 1. The toxic chemical should be soluble in oil and volatile carrier and of low solubility in water. 2. Low cost. 3. Simple in application and of rapid penetration. 4. Toxic to decay and stain organisms and to termites. 5. The

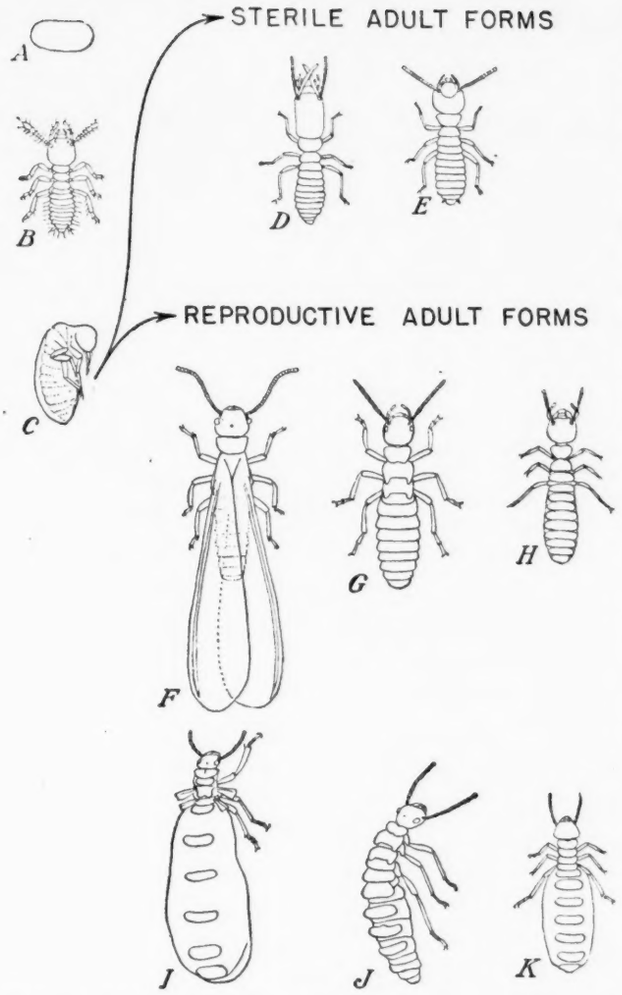


Diagram showing the relationships of the stages and forms of our common subterranean termite "Reticulitermes, flavipes": (A) Egg; (B) recently hatched nymph; (C) immature nymph in quiescent or resting stage; (D) soldier; (E) worker; (F) sexual winged adult; (G) sexual adult with wing pads; (H) workerlike wingless sexual adult; I, J, and K, enlarged egg-laying females or queens, corresponding to F, G, and H, respectively. D and E are sterile adult forms; F, G, H, I, J and K are fertile or reproductive adult forms. (The enlargements are approximately as follows: A, x 16; B, x 13½; C, x 10; D, x 4½; E, x 5½; F, x 6; G, x 4½; H, x 5; I, x 2½; J, x 2½; K, x 3.) (Courtesy "Farmers' Bull.," 1472.)

chemical should remain toxic in the wood for many years. 6. Water repellent. 7. Odorless or with no objectionable odor. 8. Colorless in wood. 9. Non-poisonous and not harmful to man. 10. Non-active to paint coatings and to metals. 11. Not highly inflammable—flash point above 100° F.

In connection with requirement No. 10, the author calls attention to an article entitled "Service of Paint on Woods Treated with Termite Repellents," by M. Randall and T. C. Doody, *J.I.E.C.*, April, 1938, pp. 444-449.

After peeling off the bark from round or slabbed timber, it is seasoned by either atmospheric or artificial drying. Wood that is resistant to penetration by preservatives is sometimes incised. This is accomplished by means of a machine which is equipped with teeth that sink into the wood to a depth of one-half to three-quarter inches, so as to permit a more even distribution of the preservative. Douglas fir ties, timber and cedar poles are treated in this fashion. However, the most effective means of preserving wood is by the pressure processes of which there are several.

This is also known as the Bethel process, and gives maximum absorption. After the timber has been charged into the treating chamber, a preliminary vacuum is applied to remove the air from the chamber and also as much as possible from the wood. The heated preservative is then admitted, filling the chamber; pressure is applied until the desired absorption is obtained; the preservative solution is then withdrawn, and vacuum applied to free the wood from dripping preservative.

The Reuping empty cell process: Air is forced, under 25 to 100 lbs. per sq. in. pressure, into the cylinder which contains the charge of timber. The preservative is then admitted, taking the place of the air which is allowed to escape in an equalizing or Reuping tank, the same pressure being maintained. The pressure is raised when the tank is full of preservative, until the maximum absorption has taken place. Finally, the preservative is drained from the cylinder and the final vacuum removes the surplus chemical from the wood.

The Lowry process differs from the Reuping in that the latter employs initial air pressure above atmospheric. In the Lowry process, the preservative is admitted into the tank under atmospheric pressure. When full, pressure is applied. Then the chemical follows the same routine as in the Reuping process. There are other processes of lesser importance.

Proof of the efficacy of termite preventives, may be cited in the experimental building of the Bureau of Entomology, U. S. Department of Agriculture, located in the Panama Canal Zone. The lumber on the building was treated with zinc chloride, and the supports were treated with creosote. After 11 years, there is no evidence of destruction. Untreated wood in this area does not last one year.

There are a number of chemicals and proprietaries for termite proofing listed in the 1930 Proceedings of the American Wood Preservers Association. Some are better than others. Tanalith, a fluoride phenol arsenic mixture; Triolith, fluoride phenol mixture: Wolman salts, Bruce preservative 5A—5 per cent. B. naphthol in oil: Ac-Sol, copper zinc-phenol mixture; Halowax No. 1,008, chlorinated naphthalene; Anaconda wood preservative, cold treater dust, chiefly crude arsenic; chromated zinc chloride which also imparts definite fire resistance.

Department of Agriculture Leaflet 101 cites cases where buildings have been infested for over 50 years, without serious damage. However, it adds that these are old colonial houses of heavy construction and well seasoned wood. It is to be inferred that present day houses cannot resist infestation by termites for so long a period. Recognizing the fact that some unscrupulous advertisers have ballyhooed termite damage to a certain extent, there is, nevertheless, a place for commercial termite proofing.

References

U. S. Dept. Agri. Wood Handbook.
U. S. Dept. Agri. Farmer's Bul. 1472.
Nat. Lumber Mfrs. Assn. Exposing the Termite.
Western Pine Assn. Bul. No. 6.
Our Enemy the Termite—T. E. Snyder.

Flexible Shellac and Casein

A flexible shellac, called Flexilac, described as an orange colored, non-inflammable, viscous resin which dries quickly to give a flexible, glossy, adhesive film which is water-soluble but not affected by hydrocarbons, has been made commercially available by Glyco Products Co., 148 Lafayette St., New York City. Because of this it may be used in cements for gaskets exposed to gasoline, naphtha, etc. Other uses are in special adhesives, polishes, agricultural spray spreaders and "stickers," insulation, cosmetics, sizings, latex, water-varnish; for finishing metal, paper, straw, textiles, rubber, leather, etc.; as a suspending agent for pigments for coloring and glazing china, porcelain, and glass.

Protoflex, a flexible casein, made also by Glyco, is a straw-colored, transparent jelly which dissolves readily in water (without heat). Such a solution dries rapidly to give a flexible almost colorless, transparent film. No alkalies or solvents are needed. Its uses are as indicated above for Flexilac.

Dr. Charles F. Mason Presents

Practical Formulae for Stove Polishes

IN this highly synthetic age, when new compounds with unusual properties are constantly being announced and adapted to practical household and industrial uses, a few chemical specialties seem to be fading out of the picture. One of these is stove and furnace polishes. This condition is not unexpected in and near large cities, where centrally located heating plants, also gas and oil stoves with baked enamel finishes, have displaced the cast iron stoves used for cooking and heating.

The adoption of oil cook stoves has been pushed into the most isolated rural sections, many miles from state highways; but cast iron stoves for heating are still in use and require polishing at definite intervals. In such sections stove polish, either in paste, stick or liquid form, is still an important item upon the shelves of paint, hardware and general supply stores.

In view of the fact that stove pipes, oven doors and other parts not exposed to direct heat are sold today with a glossy coating of baked enamel, the products described in this report comprise only those applied to metal parts which are exposed to the flame and which, when not in use, corrode rapidly.

Sodium Silicate Solutions

Unlike other items, which fall under the general classification of polishes, these are designed or formulated to deposit eventually an opaque, heat-resistant solid in the form of a film. Graphite has properties which adapt it to this purpose, and the high polishing forms could be applied with a fibrous applicator to degreased stove parts. This has not been attempted, probably because the fluffy nature of graphite would cause it to distribute through the surrounding air and onto many parts where it is not desired. For some industrial uses, where it is mixed and used at once, graphite is stirred into viscous sodium silicate solutions and applied with due precautions for the strong alkaline nature of the product. Recently sodium silicate solutions, with graphite dispersed therein, have become available for this purpose. These can be shipped in tin lined cans.

However, graphite is usually dispersed in liquid, paste and semi-solid vehicles of an organic nature, which after application are burned off leaving behind the graphite interspersed with amorphous carbon from the vehicle.

Graphite possesses the peculiar property, not possessed by other finely divided solids, of adhering tenaciously to smooth surfaces upon which it is rubbed. This may be attributed to the shape and nature of the particles, which are plates of an oily nature and rubbing under pressure distributes and flattens them into a film. It is eventually burned off and lost by abrasion.

Artificial Graphite

Although some artificial graphite is available as a by-product from electric furnace operations, the majority of it is essentially a mineral, which is mined and refined to obtain the maximum carbon content, maximum percentage of flakes and smallest particle size.

The uninitiated is usually amazed at the enormous number of grades of graphite for sale by producers, ranging from five to seventy cents per pound. The specifications are carbon content and particle size with no data upon the ratio of flakes to amorphous carbon. However, those listed under high polish by reliable producers are usually the more expensive and should be chosen for satisfactory stove polishes.

The formulae listed below contain rather high contents of binder which is burned off, but they are of a consistency which promotes ease of application and are what the public wants.

Liquid Form

1.	Asphalt (by-product)	11.
	Asphalt (gilsonite)	6.
	Paraffin	10.
	Naphtha (varnoline)	25.
	Graphite	20.
	Carbon tetrachloride	25.
	Nigrosine (oil soluble)	3.

The natural asphalt is first crushed and heated until it can be stirred; then the by-product asphalt is poured in and heating continued until a homogeneous liquid results. The paraffin is then added, and after it has melted, the container is removed from the flame and the naphtha stirred in. When it is homogeneous the black liquid is passed through a screen to remove coarse minerals always present in gilsonite. In the meantime, the graphite and nigrosine are soaking in the carbon tetrachloride, and when both containers are at room temperature, the contents are mixed and are ready for packaging. In view of the fact that graphite forms aggregates or lumps in mixtures, where water is absent, it might settle to the bottom upon long standing and not be redispersed with vigorous shaking. However, the paraffins present in this mixture have a thickening effect and offset settling.

2.	Rosin	7.
	Montan Wax (crude)	2.
	Naphtha (varnoline)	2.
	Caustic soda	1.
	Water	70.
	Nigrosine	3.
	Graphite	12.
	Lamp black	3.

It is obvious that this is an emulsion of montan wax and naphtha in water with a rosin soap as an emulsifier. The nigrosine, lamp black, graphite and a salt of sodium will be deposited after heat is applied. It cannot be classed as fire-proof because naphtha and water are evaporating during and after application. It is one of the less expensive types which must be sold in glass containers, because its alkaline reaction would soon corrode tin lined iron cans.

The caustic soda is dissolved in ten parts of the water specified, and the rosin is passed through a sieve into this solution which should be kept at or near 100° F. The wax is melted over boiling water or by steam: the naphtha is added and heating continued until a liquid results. This can then be poured slowly into the warm soap solution with constant stirring.

The water soluble nigrosine, graphite and lamp black are stirred into the balance of the water, which is at 100° F., and when all lumps are broken up, the wax emulsion is added with vigorous agitation.

Paste Form

1.	Bone black	24.
	Graphite	24.
	Ferrous sulfate	6.
	Water	46.

This is one of the oldest types of iron polish and is based upon the principle, that the acid present from the hydrolysis

of the ferrous sulfate will etch a smooth iron surface sufficiently to produce a rough surface, upon which the black pigments will adhere very firmly. Being in paste form, more water may be added from time to time to make it more workable, and after heat is applied to the polished part, water and decomposition products of sulfuric acid are evolved. This cannot be packaged in tin lined cans and is recommended only for industrial use, because oxides of sulfur in the home are injurious, but in industry good ventilation is usually provided.

Paste Form

2.	Paraffin wax	10.
	Candelilla wax	10.
	Graphite	20.
	Naphtha (varnoline)	59.
	Lavender oil	1.

The waxes are melted by hot water or steam and poured into the naphtha, which has been heated to the same temperature as the wax and in a similar manner.

The graphite and perfume oil are stirred into this and kept hot until a smooth slurry results, when heating can be stopped. When cooling has proceeded to the point where stirring is difficult, the mixture, still plastic, can be poured into tin cans to cool and set.

Stick Form

1.	Ozokerite	30.
	Bees wax	13.
	Rosin	10.
	Castor oil	5.
	Graphite	33.
	Carbon black	9.

The rosin and castor oil mixture is stirred over direct heat until a clear liquid results, which is poured into the waxes which have been melted by hot water or steam heat. The pigments are stirred in, heating is continued, and when a smooth cream results the heating is stopped and cooling allowed to proceed until viscous. Then it can be poured into cold molds of the hinge type. These sticks need only wrapping with a label, and the first cost to the producer is lessened.

2.	Resin (gutta percha)	14.
	Rosin (colophony)	14.
	Graphite	22.
	Lamp black	14.
	Castor oil	7.
	Naphtha (varnoline)	29.

This is produced in a manner exactly similar to the one in stick form described in the previous paragraph.

In conclusion it may be well to add that this class of compounds has received no attention in the journals in the past thirty years, and it is clear that such a condition will not last long, because all that is needed are binders or vehicles which will volatilize and be effective in lower concentrations than the waxes and asphalts mentioned above. Naturally such vehicles, if chosen from the synthetic store-house, in which there is an abundance, must not have toxic effects in them or their decomposition products.

Protection for Welded Surfaces

Glyptal No. 1294 has been announced by General Electric Co., Schenectady, N. Y., for prevention of the adhesion of weld spatter to metals which are to be welded. This material, which can be used without harm on any metal surface, including polished stainless steel, will not produce carbon to make the weld hard or brittle, nor will it reduce ductility. Likewise, it will not give off smoke to fog up the atmosphere, and it will not form gas pockets or cause the weld to be porous. On surfaces which are to be painted, this material further serves as an excellent priming coat. In addition, it prevents the forming of rust on steel in storage yards. This is particularly important if the steel is to be subsequently welded.

Waterproofing Products

Two new waterproofing compounds, Ranetite bonding compound and Ranetite No. VVV cement waterproofing, have been added to the line of Ranetite Mfg. Co., 1917 So. B'way, St. Louis, Mo.

Sheet Iron Cleaner

A product of interest to the porcelain enamel industry is Pemco Cleaner, for cleaning most mineral or vegetable oils from sheet iron commonly used for stamping or drawing operations. Manufacturer, Porcelain Enamel & Mfg. Co., Balto., claims it cleans well because its action soapifies and emulsifies. It makes the cleaning of a new batch of cleaner 100 per cent. efficient immediately.

Deopacifying Agent

A deopacifying agent, known as Pemco Unifier, has been announced by Porcelain Enamel & Mfg. Co., Balto. It will correct the color of second and third coat enamel, thereby giving a perfect match in reworks—free of a specky finish.

Protective Coating

Protex, a new latex compound, developed by American Anode Co., can be sprayed on white shoes, automobile fenders, refrigerators, instrument panels, etc., to form a soft tough film, which is said to protect the surface against scratches or chipping during further processing or shipping. After serving its protective purpose, it can be easily stripped from the object on which it has been sprayed. Firm is located at Akron, O.

Metal Coating

A coating of a thin layer of iron can be deposited on aluminum or an aluminum alloy by immersion in a bath containing ferrous chloride hexahydrate and commercial, 35-38 per cent., hydrochloric acid, preferably in equal proportions, at a temperature above 80° C., preferably 92-95° C. It is then electroplated; first, with a thin layer of nickel, nickel-copper or other nickel alloy and then with a thicker layer of chromium. Specification 476,720 of Dr. Finckh, Ges., mentioned in *Chemical Age*, July 2, 1938, p. 6.

Cleaner for Aluminum Engine Castings

The self-emulsifying solvent, Gunk, recently introduced by Curran Corp., Malden, Mass., is said to possess the properties of degreasing and leaving aluminum engine castings with a new silver-white appearance without any chemical effect, etching, or loss of weight of the metal.

Dry Powdered Fungicides

In the production of dry powdered fungicides for spraying and dusting vegetation, a zeolite is formed from gelling mixtures of sodium-silicate and sodium-aluminate or aluminum-sulfate solutions and a solution of a copper salt such as the sulfate, the reagents being used in such proportions that the zeolite contains non-exchangeable copper in more than equimolecular ratio to the alumina, and that the molecular proportion of silica is equal to, or greater than, that of the alumina and copper oxide taken together. The copper salt may be added at any time prior to final drying of the gel, and the reaction mixture preferably has a substantially neutral reaction. The final gel is dried, washed, and comminuted to a fine powder, drying being effected preferably in two stages, the partially dried gel being granulated in water, then washed, drying being completed before grinding. The copper content of the gel may be increased by adding alkali to the neutral gel and then further copper sulfate. In the examples the gels may contain per mol. Al_2O_3 from 1.2 to 10.4 mols. CuO and from 2.83 to 12.5 mols. SiO_2. E.P. 484,115, reported in *Chemical Trade Journal*, July 29, 1938, p. 108.

Modeling Clay

Manufacturers of molded articles in many lines of production, whether from synthetic resins of plastic composition, metals, glass, or similar materials, frequently desire to visualize the finished product and make necessary changes before undertaking to produce the items in quantity. The Glycerine Producers' Association, according to *Ceramic Age,* Sept., '38, p. 86, points out that a simple inexpensive, yet permanently plastic modeling clay for such usage is readily made by mixing glycerine with clay and adding petrolatum to give the desired consistency. This clay may be used also for the usual artistic purposes and for making impressions of objects.

Protective Coatings

A line of protective coatings for solving painting problems peculiar to the pulp and paper industry is announced by X-Pando Corp., 43-15 Thirty-Sixth st., Long Island City, N. Y. These coatings are highly resistant to acid and fume conditions and are very successful in application to beaters. They can be applied to any surface, including metal or wood, that has been cleaned thoroughly of all loose particles; and produce a smooth finished surface with no "lift." The base for these coatings is made from fused fossil gums rather than linseed oil. The line, known as Manotox, includes three products, one a transparent waterproofing designated as X-Pandoseal Formula "B," and the other two as F-68 and B-92, respectively. F-68 is supplied in white, black, gray, green and red colors; while B-92 comes in brown only.

Metal Rustproofing Agent

A metal rustproofing agent, *e.g.,* for browning gun barrels and gun parts, includes a liquid produced by nitriting an alkyl derivative of a cyclic alcohol by means of an acid and an inorganic nitrite and, after the reaction is complete, adding a solvent for the organic nitrite and filtering. Rustproofing material may consist of about 3 per cent. of the liquid so formed together with water and one or more metallic salts. In an example, 2-methylcyclohexanol is mixed with sodium nitrite and water and to the mixture, which is agitated vigorously, a mixture of 1 part of pure sulfuric acid and 2 parts of water is added, resultant liquid being cooled continuously until the reaction is complete. Methylated spirit is then added and the liquid filtered. Filtrate may be mixed with a saturated solution of ferrous sulfate, a solution of antimony chloride, copper sulfate, and water to form a rustproofing material. The metal is cleaned and polished with lime water before material is applied. Specification 476,006 mentioned in *Chemical Age,* July 2, 1938.

New Creosote Paint

A new paint, developed for covering creosoted wood block flooring, product of Reilly Tar and Chemical Corp., Indianapolis, Ind., is said to provide a coating that will form an effective seal through which neither pitch nor creosote can penetrate. New product, known as Reilly Creocote Paint, according to company, provides a dry, hard bright finish which is highly resistant to abrasion and wear and impervious to oils and dilute acids. It is available in five attractive colors: green, yellow, red, black and brown. Factory aisles and fire danger zones are given improved visibility for increased production and safety for workers. Its use prevents tracking pitch or oil into adjoining offices from factory floors. Product makes possible use of creosoted wood block floors where they have never been used before. All the advantages of long wear, silence and comfort in wood block floors are now available for practically every type of private and public buildings. It can be used to increase the visibility of creosoted poles along highways, and its use is suggested on creosoted guard-rail and structural timbers.

Rubber Concrete

Ucrete rubber concrete for paths, floors, roads, roofs, playgrounds, tennis courts, etc., comprises a mixture of special rubber solution and concrete powder, supplied separately so that the user can obtain the desired physical properties in the finished product. Various intermediate combinations of the properties of both rubber and concrete may be obtained by varying proportions of the two components. When mixed, product is plastic and can be molded by hand or machine into any desired shape. It also can be applied with a trowel, and the finished product can be cut, sawed, or drilled. As the new composition sets like cement, it is not dependent upon evaporation, according to *India Rubber World,* Sept. 1, 1938, p. 48. With strong adhesive properties "Ucrete" will adhere to glass or smooth metals, making it suitable as a jointless lining for tanks. Owing to its rubber content, the new material can be used for waterproofing purposes and may be applied to a wet surface.

Synthetic Leader Material

A synthetic leader material for fishing tackle leaders, designed to fill the place occupied by Spanish gut, is being manufactured by du Pont and fabricated into leaders by Lyon & Coulson, Buffalo, N. Y. At present filament is being tested by fabricators and a few sportsmen to determine its suitability for tackle. Preliminary tests indicate the material is equal in strength to Spanish gut of equal size; it does not swell in water, and resists fraying and cracking. If tests confirm the material's adaptability for the purpose, it is expected that it will be available to anglers next season.

Effect of Repeated Weather Exposure on Moisture-Excluding Effectiveness of Various Varnishes (Hunt)†

Varnish	Amount of moisture absorbed after weather exposures of various times in weeks (g. per sq. ft.)									
	Orig.	6	12	18	24	30	48	54	66	78
Phenolic Resin Spar	1.43	1.81	1.05	1.33	2.28	2.48	4.10	4.0	5.03	11.71*
Spar 1	27.30	26.48	22.65	21.70	...	27.80	**	...	...	...
" 2	25.51	....	42.00	38.75	27.70	**	...	...	...	...
" 3	44.48	44.48	47.60	16.86	**	...	...	...	...	...
" 4	32.84	39.32	43.90	14.00	43.05	**	...	...	...	...
" 5	43.10	37.42	44.25	13.81	50.10	**	...	...	...	...
" 6	20.10	21.60	37.90	17.43	18.00	21.60	31.60	**	...	...
" 7	25.70	24.95	29.80	31.80	23.31	30.65	**	...	...	...
" 8	19.90	24.38	31.70	23.70	36.00	37.70	...	...	...	...

* Still in test after 78 weeks
** Discontinued due to failure

It is interesting to note that the average original moisture absorption through the eight non-phenolic varnishes is over twenty times greater than through the phenolic spar. Also, after 48 weeks exposure all but the latter have failed completely. The phenolic spar after 78 weeks outside exposure is still in good condition and has much better resistance than any of the others had originally and is still in good condition.

† Table taken from address, "Synthetic Resins That Fortify Paints and Varnishes," delivered recently by Robt. J. Moore, Bakelite Corp., at N. Y. Museum of Science and Industry.

New Trade Marks of the Month

364,357. Pylam Products Co., New York City; Apr. 29, '35; dyes and bleaching materials; use since Feb., 1932.

367,186. Ditto, Inc., Chicago, Ill.; July 12, '38; solvent for duplicating machines; use since Oct. 25, '34.

391,521. Dow Chemical Co., Midland, Mich.; Apr. 19, '37; ethyl cellulose; use since Feb. 9, '37.

391,746. Columbia Refining Co., Long Island City, N. Y.; Apr. 23, '37; motor lubricating oils and greases; use since Jan. 15, '37.

395,000. Pure Oil Co., Chicago, Ill.; July 8, '37; mineral lubricating oils and fuel oils for diesel engines; use since Jan., 1935.

396,734. Cook Paint & Varnish Co., North Kansas City, Mo.; Aug. 25, '37; paints; use since Apr. 11, '37.

397,170. Barrett Co., New York City; Sept. 7, '37; for pitch, tar, bituminous materials for compounding rubber, and asphalt; first use since Jan. 1, 1893.

402,458. Anderson Company, Gary, Ind.: Jan. 29, '38; cleaner for windshields and other glass surfaces; use since Dec. 3, '37.

400,423. James B. McComb, New York City; Dec. 3, '37; cleaning preparation for floor coverings, textiles, glass, metal, etc., and for laundry purposes; use since Aug. 5, 1922.

400,675. American Disinfecting Co., Inc., Sedalia, Mo.; Dec. 10, '37; preparation for surfacing, dressing, polishing, and finishing floors and linoleum, liquid wax for floors, etc.; use since 1925.

401,333. J. Cohen & Son, Peoria, Ill.; Dec. 29, '37; gasoline; use since Dec. 15, '37.

402,088. Dow Chemical Co., Midland, Mich.; Jan. 19, '38; methyl cellulose; use since Jan. 7, '38.

403,214. Louisville Cement Co., Louisville, Ky.; Feb. 19, '38; Portland cement; use since Dec. 24, '37.

402,496. Fiba-Seal Chemicals, Inc., Hoboken, N. J.; Jan. 29, '38; waterproofing or preservative compound for industrial use; use since Apr., '37.

405,935. Albert C. S. Raymond (Champion Products Co.), Orange, Mass.; May 2, '38; cleansing preparation for household, laundry and dairy use; use since Nov. 1, '37.

404,190. Standard Enamel and Paint Corp., Indianapolis, Ind.; Mar. 17, '38; paint; use since May 10, '34.

402,497. Fiba-Seal Chemicals, Inc., Hoboken, N. J.; Jan. 29, '38; waterproofing preparation for wood, brick, stucco, etc.; use since Apr., '37.

402,498. Fiba-Seal Chemicals, Inc., Hoboken, N. J.; Jan. 29, '38; waterproofing preparation for silk, rayons, cellulose fabrics, canvas, etc.; use since Apr., '37.

402,733. Master Brands, Inc. (Zoro Co.), Chicago, Ill.; Feb. 5, '38; toilet bowl deodorant; use since Jan. 2, '38.

403,641. Cosden Petroleum Corp., Fort Worth, Tex.; Mar. 3, '38; lubrication oils. cup grease, transmission and differential greases; use since Jan. 1, '36.

405,541. Charles Scott Althouse (Althouse Chemical Co.), Reading, Pa.; Apr. 21, '38; dyes and dyestuffs; use since March, '35.

403,643. Cosden Petroleum Corp., Fort Worth, Tex.; Mar. 3, '38; gasoline, benzine, kerosene, motor fuel oil; use since Jan. 1, '36.

403,642. Cosden Petroleum Corp., Fort Worth, Tex.; Mar. 3, '38; gasoline, benzine, kerosene, motor fuel oil; use since Jan. 1, '36.

404,310. Goyescas Corp., New York City; Mar. 21, '38; for soap; use since Feb. 28, '38.

404,589. Andrew Mancuso, Kansas City, Mo.; Mar. 25, '38; bleach, disinfectant, germicide, deodorant, water remover, etc.; use since Mar. 1, '35.

404,675. F. Marty & Co., Syracuse, N. Y.; Mar. 30, '38; hand dipped candles; use since Jan. 1, '37.

404,339. E. L. Wilson (NuWay Battery Service Co.), Jamaica, N. Y.; Mar. 21, '38; battery compounds for rejuvenating batteries; use since Oct. 15, '31.

405,974. Universal Atlas Cement Co., Chicago, Ill.; May 3, '38; Portland cement; use since Apr. 25, '38.

405,669. Scholler Brothers, Inc., Phila., Pa.; Apr. 23, '38; textile soap and cleaner for painted, enameled, lacquered and varnished surfaces; use since May 28, '37.

405,306. John J. Markman, Washington, D. C.; Apr. 15, '38; artificial ice; use since Apr. 9, '38.

405,542. Charles Scott Althouse (Althouse Chemical Co.), Reading, Pa.; Apr. 21, '38; dyes and dyestuffs; use since June, 1929.

405,544. Charles Scott Althouse (Althouse Chemical Co.), Reading, Pa.; Apr. 21, '38; dyes and dyestuffs; use since Nov., 1936.

405,565. Ohio Oil Co., Findlay, Ohio; Apr. 21, '38; lubricating oils and greases; use since Nov. 23, '37.

405,988. Hart Products Corp., New York City; May 4, '38; soaps and soap preparations; use since Jan. 13, '36.

406,026. Metals Disintegrating Company, Inc., Union, N. J.; May 5, '38; flaked disintegrated metal for use as paint pigments; use since Apr. 15, '31.

406,613. J. R. Watkins Co., Winona, Minn.; May 21, '38; lubricating oils; use since Dec., 1930.

406,571. Bro-Kade Wall Finish Co., Milwaukee, Wis.; May 20, '38; paints and varnishes; use since May 1, '38.

406,134. Milton S. Hurwitz, Seattle, Wash.; May 9, '38; lubricating oil; use since Feb. 1, '38.

406,717. I. G., Frankfort-on-the-Main, Germany; May 25, '38; synthetic rubber and like materials; use since Apr. 26, '32.

406,725. Logan Bulk Filling Station, Inc., Logan, Ohio; May 25, '38; gasoline and lubricating oils and greases; use since May 1, '34.

406,784. Standard Oil Co. of N. J., Wilmington, Del.; May 26, '38; gasoline and lubricating oils; use since May 2, '38.

406,939. Patek & Co., San Francisco, Calif.; May 31, '38; chlorinated hydrocarbons used as dry cleaning solvents; use since Oct. 1, '36.

407,020. General Paint & Varnish Co., Chicago, Ill.; June 2, '38; paints, varnishes, and paint enamels; use since 1928.

† Trade-marks reproduced and described cover those appearing in the *U. S. Patent Gazettes*, Aug. 23 through week Sept. 13, inclusive.

407,023. J. Leon Kahn (Novotex Labs.), Washington, D. C.; June 2, '38; preparation for stiffening, preserving, and fulling textiles; use since May 25, '38.

407,152. Madison & Son, Great Falls, Mont.; June 6, '38; dance floor wax; use since May 10, '38.

407,109. Patterson-Sargent Co., Cleveland, Ohio; June 4, '38; paints, enamels, stains, lacquers, varnishes; use since Aug., 1933.

407,058. H. B. Davis Co., Baltimore, Md.; June 3, '38; paints, enamels, stains, etc.; use since Sept. 28, '27.

407,167. Universal Atlas Cement Co., Chicago, Ill.; June 6, '38; Portland cement; use since May 6, '38.

407,238. National Aniline & Chemical Co., New York City; June 8, '38; protective oxidizing agent and kier-boiling assistant for dyed and printed materials; use since Mar. 7, '38.

407,252. Weast Brothers, Landis, N. C.; June 8, '38; varnish; use since June 6, '38.

407,362. Celluloid Corp., Newark, N. J.; June 11, '38; chemical substance for use as a lubricant, in gas filtering media, and for production of other chemical compounds or derivatives; use since May 13, '38.

407,427. Dow Chemical Co., Midland, Mich.; June 13, '38; dry cleaning solvent; use since June 1, '38.

407,462. General Chemical Co., New York City; June 14, '38; lime; use since Jan., 1880.

407,463. Hercules Powder Co., Wilmington, Del.; June 14, '38; synthetic resinous material used as an adhesive for binding pigments to paper, cloth to cloth, etc.

407,508. Surface-Proofing Prods., Inc., New York City; June 15, '38; sound deadening and moisture resisting composition in nature of a paint; use since Mar. 11, '38.

407,509. Surface-Proofing Prods., New York City; June 15, '38; corrosion-resistant paint; use since May 16, '38.

407,561. Rohm & Haas Co., Phila., Pa.; June 16, '38; insecticides, fungicides, disinfectants; use since May 26, '38.

407,611. Warwick Chemical Co., West Warwick, R. I.; June 17, '38; textile dyeing and printing assistant; use since June 1, '38.

407,583. Albert E. Cloutier (Dresol Chemical Co.), Fall River, Mass.; June 17, '38; water softener and bleaching preparation for clothes, dishes, etc.; use since May 15, '38.

407,615. French Renovating Co., Cleveland, Ohio; June 16, '38; dyes; use since Oct. 1, 1910.

407,641. Rohm & Haas Co., Phila., Pa.; June 18, '38; printing paste for printing textiles; use since June 16, '38.

407,675. Kleso Mfg. Co., New York City; June 20, '38; cleaner for Venetian blinds; use since Apr. 4, '38.

407,760. Margaret B. McGill, Seattle, Wash.; June 22, '38; garden fertilizers; use since May 9, '38.

407,773. Tarr & Wonson, Gloucester, Mass.; June 22, '38; marine finishes; use since Mar., 1934.

408,069. Marietta Paint & Color Co., Marietta, Ohio; June 30, '38; clear varnishes, lacquers, and paint enamels; use since May, 1938.

407,855. Erlo Prods., Inc., Muncie, Ind.; June 24, '38; soap flakes-chips, and washing powders; use since June 6, '38.

407,992. H. D. Roosen Co., Brooklyn, N. Y.; June 28, '38; ink compounds; use since May 24, '38.

408,070. Herman J. Moskowitz, Mount Vernon, N. Y.; June 30, '38; preparation for removing adhesive tape; use since May 30, '38.

408,085. Bell Company, Inc. (Flare Labs.), Chicago, Ill.; July 1, '38; liquid radiator cement, radiator rust preventative-cleaner, hydraulic brake fluid, and similar industrial specialties; use since Apr. 14, '38.

408,086. Bell Company, Inc. (Flare Labs.), Chicago, Ill.; July 1, '38; glass shellac, paint and varnish remover, automobile polishes and cleaners, and similar items; use since Apr. 14, '38.

408,088. Bell Co. (Flare Labs.), Chicago, Ill.; July 1, '38; fabric cleaner, dry cleaner, metal polish, wax cleaning compound for automobiles, and like industrial specialties; use since Apr. 14, '38.

408,162. I. F. Laucks, Inc., Seattle, Wash.; July 2, '38; glue; use since June 23, '38.

408,167. Rohm & Haas Co., Phila., Pa.; July 2, '38; insecticides, fungicides, and disinfectants; use since June 20, '38.

408,181. American Chemical Paint Co., Ambler, Pa.; July 5, '38; preparations to stimulate growth of plants and germination of seeds; use since June 8, '38.

408,212. Standard Alcohol Co., Wilmington, Del.; July 5, '38; cleaning fluid; use since 1925.

408,290. Thomas Chem. Co., New York City; July 7, '38; jewelry cleaner; use since June 23, '38.

408,333. C. M. Kimball Co., Everett, Mass.; July 9, '38; window cleaning and windshield cleaning preparation; use since Dec. 14, '37.

408,389. Marion Laboratories, Inc., Chicago, Ill.; July 11, '38; non-inflammable liquid cleaning composition for leather, all types of fabrics, Venetian blinds, shades, and all general household cleaning uses; use since 1929.

408,404. Tex-Ite Prods. Corp., Brooklyn, N. Y.; July 11, '38; soap powder; use since Apr. 5, '38.

408,431. William Edwin Miller (Zip Mfg. Co.), Oklahoma City, Okla.; July 12, '38; insecticide and hair oil, pure glycerine, castor oil, concentrated bluing, mineral oil; use since June, '35.

408,494. Columbia Products Corp., Washington, D. C.; July 14, '38; cleaner for all types of China plumbing fixtures; use since July 5, '38.

408,502. Independent Starch Co., New York City; July 14, '38; laundry starches; use since Feb. 20, 1908.

408,506. Patterson-Sargent Co., Cleveland, Ohio; July 14, '38; paints, stains, lacquers, varnishes; use since June 20, '38.

New Uses Are Indicated for

PHOSPHOLEUM

(TETRA PHOSPHORIC ACID)

A Superior, High Strength Phosphoric Acid

PHOSPHOLEUM is the trade name for Monsanto Tetra Phosphoric Acid, a high strength phosphoric acid analogous to the oleums of sulfuric acid. It has a P_2O_5 content of 83% compared with 55% for the ordinary 75% ortho phosphoric acid of commerce. The P_2O_5 content corresponds to the formula $H_6P_4O_{13}$ and the acid contains no water except that of chemical combination.

PHOSPHOLEUM is practically a water-white viscous liquid which does not crystallize at a temperature as low as -50° C.

This acid of high P_2O_5 content lends itself readily to the preparation of organic phosphates; can be used as a dehydrating agent; and permits development of processes heretofore retarded because of a lack of suitable phosphoric acid of comparable strength.

SPECIFICATIONS OF PHOSPHOLEUM

Description and Color	**Practically water-white viscous liquid**
Viscosity (Saybolt Universal)	**2000 sec. @ 85° C. 700 sec. @ 125° C.**
Specific Gravity (Water at 36.1° C.)	**20° C. — 2.060 100° C. — 1.983 125° C. — 1.960**
P_2O_5	**82% — 84%**
Crystallizing Point	**No crystallization at -50° C.**

A sample of MONSANTO PHOSPHOLEUM will be sent to you on request for your experimentation.

Monsanto Chemical Company
ST. LOUIS, U.S.A.
New York • Chicago • Boston • Birmingham
Charlotte • Detroit • Los Angeles
San Francisco • Montreal

Monsanto Phosphates Include:

Mono Sodium Phosphate	Mono Ammonium Phosphate
Di Sodium Phosphate	Di Ammonium Phosphate
Tri Sodium Phosphate	Mono Calcium Phosphate
Sodium Pyrophosphate	Di Calcium Phosphate
	Tri Calcium Phosphate

CHEMICALS of QUALITY
Monsanto
ST. LOUIS, U.S.A.

Standard
BICHROMATES

BICHROMATE OF SODA
BICHROMATE OF POTASH
CHROMATE OF SODA

PRIOR CHEMICAL CORP.
420 LEXINGTON AVENUE • NEW YORK
Sole Selling Agents for
STANDARD CHROMATE DIVISION
Diamond Alkali Company, Painesville, Ohio

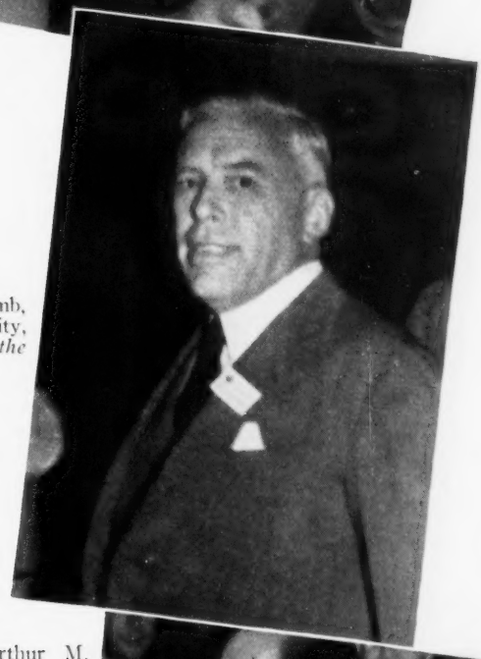
The A. C. S. at Milwaukee

Dr. W. J. Podbielniak, Podbielniak Industrial Research & Engineering Labs.

Dr. Henry B. Hass, Purdue University, and Mrs. Hass

Dr. C. S. Boruff, technical director, Hiram Walker & Sons

Dr. Frank C. Whitmore, president, A. C. S.



Dr. Arthur B. Lamb, Harvard University, editor, *Journal of the A. C. S.*

Dr. Peter Firemen

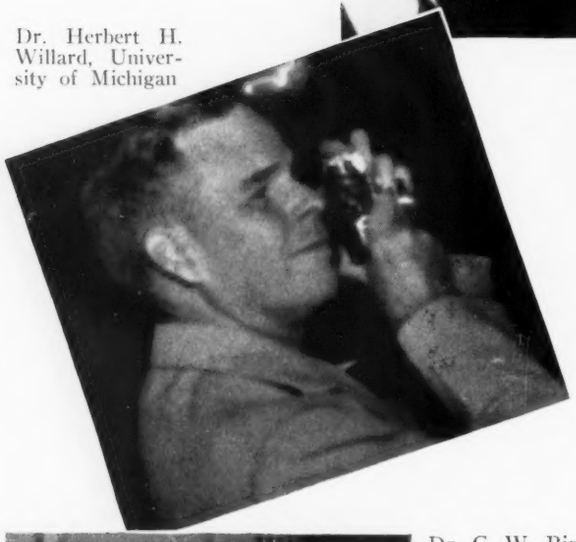
Dr. Arthur M. Buswell, University of Illinois

Dr. Charles L. Parsons, secretary, A.C.S., and Dr. Gustavus J. Esselen, consultant

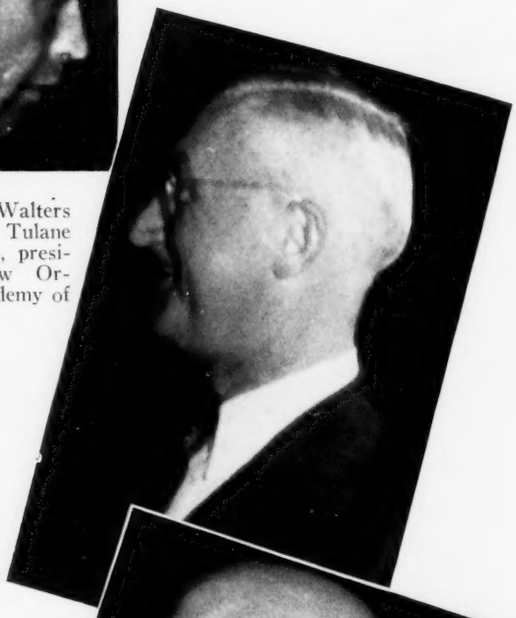
More Milwaukee Shots

Dr. George F. Rugar, Hooker Electrochemical, and Dr. Donald Price, National Oil Products

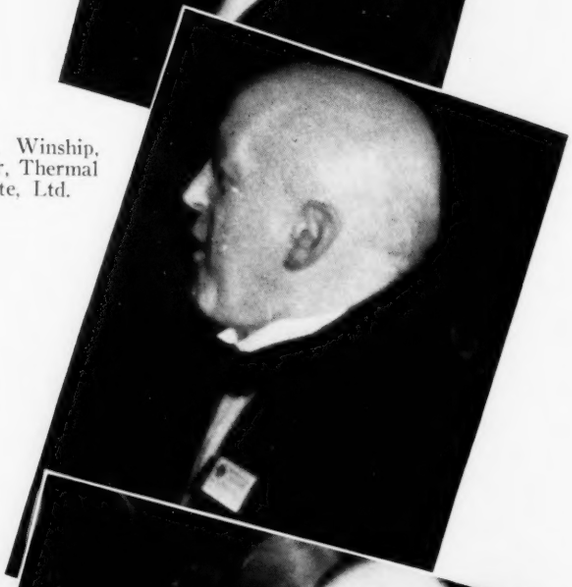
Dr. Herbert H. Willard, University of Michigan



Dr. Hal Walters Moseley, Tulane University, president, New Orleans Academy of Sciences



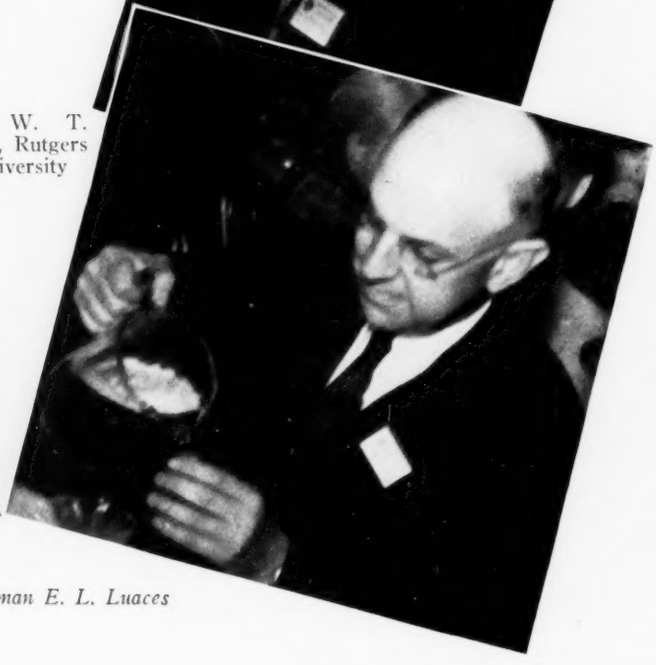
W. W. Winship, manager, Thermal Syndicate, Ltd.



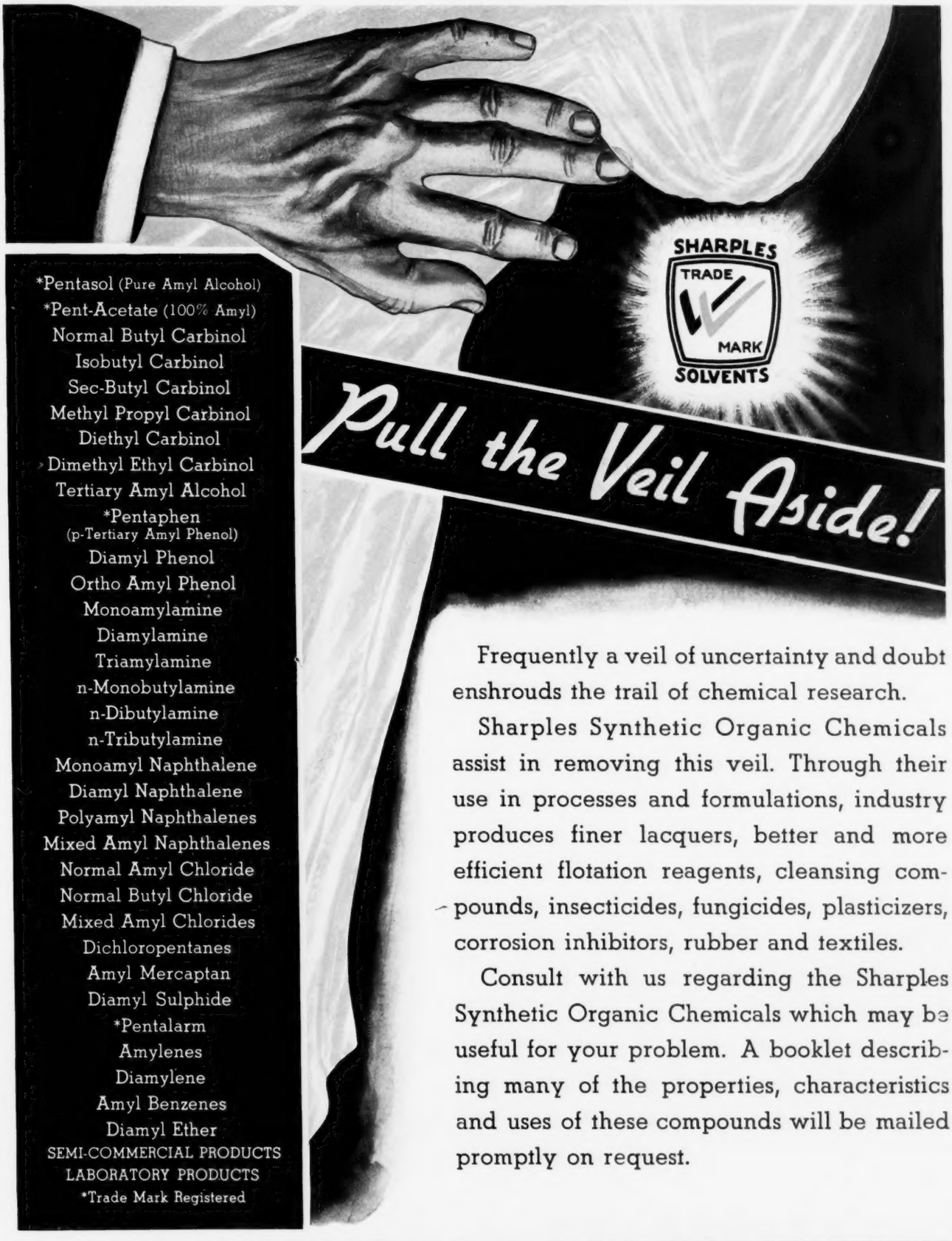
Dr. C. W. Rippie, Solvay Sales Corp.

M. L. Blanc, president, and J. L. Wilmotte, secretary, Industrial Sales Corp.

Dr. W. T. Read, Rutgers University



Photos by Cameraman E. L. Luaces



*Pentasol (Pure Amyl Alcohol)
*Pent-Acetate (100% Amyl)
Normal Butyl Carbinol
Isobutyl Carbinol
Sec-Butyl Carbinol
Methyl Propyl Carbinol
Diethyl Carbinol
Dimethyl Ethyl Carbinol
Tertiary Amyl Alcohol
*Pentaphen
(p-Tertiary Amyl Phenol)
Diamyl Phenol
Ortho Amyl Phenol
Monoamylamine
Diamylamine
Triamylamine
n-Monobutylamine
n-Dibutylamine
n-Tributylamine
Monoamyl Naphthalene
Diamyl Naphthalene
Polyamyl Naphthalenes
Mixed Amyl Naphthalenes
Normal Amyl Chloride
Normal Butyl Chloride
Mixed Amyl Chlorides
Dichloropentanes
Amyl Mercaptan
Diamyl Sulphide
*Pentalarm
Amylenes
Diamylene
Amyl Benzenes
Diamyl Ether
SEMI-COMMERCIAL PRODUCTS
LABORATORY PRODUCTS
*Trade Mark Registered

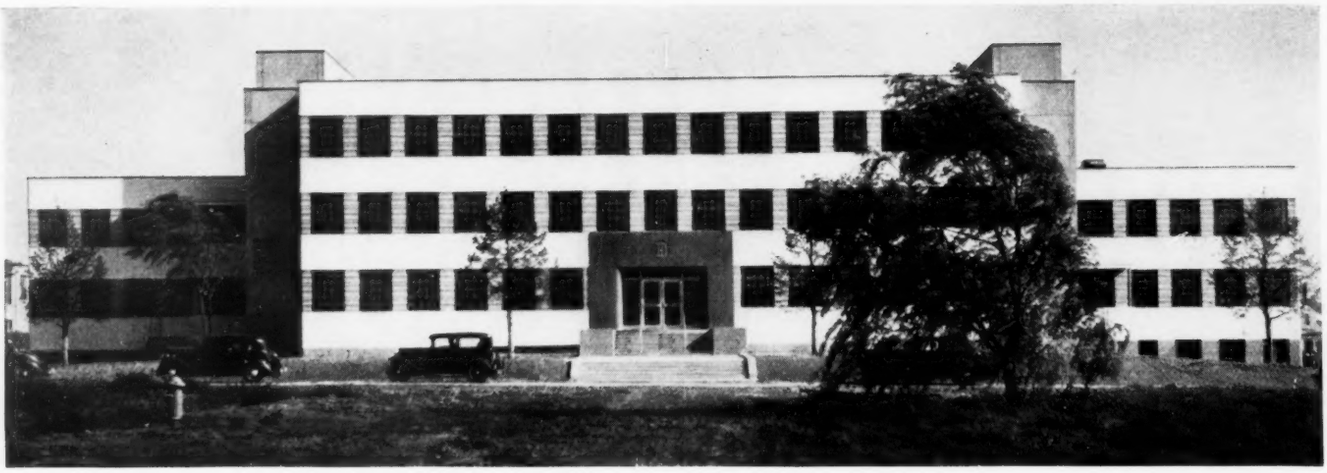
Frequently a veil of uncertainty and doubt enshrouds the trail of chemical research.

Sharples Synthetic Organic Chemicals assist in removing this veil. Through their use in processes and formulations, industry produces finer lacquers, better and more efficient flotation reagents, cleansing compounds, insecticides, fungicides, plasticizers, corrosion inhibitors, rubber and textiles.

Consult with us regarding the Sharples Synthetic Organic Chemicals which may be useful for your problem. A booklet describing many of the properties, characteristics and uses of these compounds will be mailed promptly on request.

SHARPLES SOLVENTS

THE SHARPLES SOLVENTS CORP., 23rd and Westmoreland Streets, Philadelphia, Pennsylvania

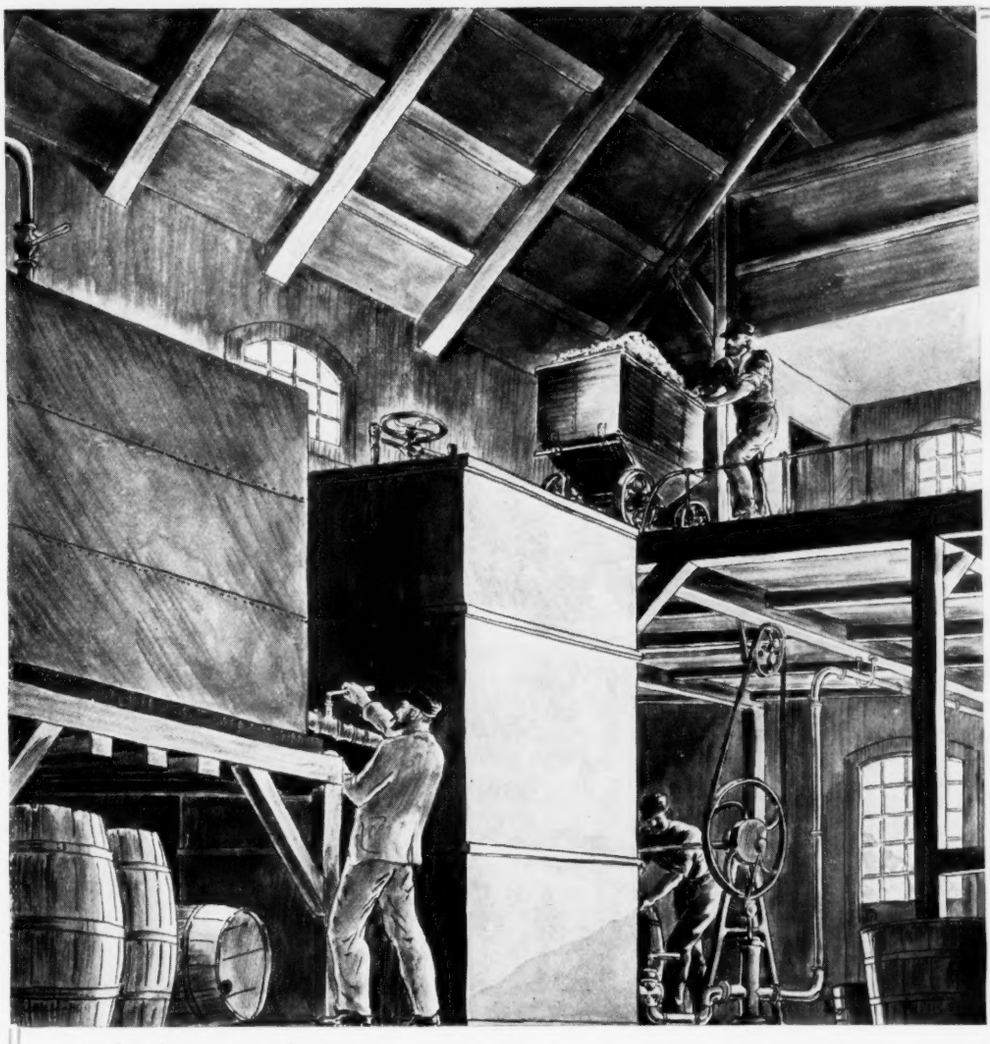


New Squibb Institute for Medical Research at New Brunswick, N. J., which will be dedicated this month. One hundred rooms in the model $750,000 laboratory building will be immediately utilized by a staff of scientists assembled from leading institutions of the United States and foreign countries.

The first annual Dow Dry Cleaning Distributors Conference, sponsored by Dow Chemical Company, was held in Midland, Michigan, last month, and was attended by eighty delegates from all over the U. S. During the three-day convention plans were presented for an intensive 1938-39 merchandising campaign.

Photograph, Courtesy "The Charleston Mail."

Science and fun vie at Carbide outing—the use of chemicals in extinguishing fires was dramatized by a fire-fighting contest, which was a feature of the recent annual outing held by Carbide & Carbon for employees of their South Charleston plant.



Part of Early European Soda Plant

Through The Centuries With Alkalies

During the middle of the last century, when soda was made almost wholly by the Le Blanc process, various patents were taken out for the manufacture of soda by another process, now known as the ammonia-soda process. This process, which made use of chemical reactions made known years before by John Thom, a Glasgow chemist, and by others was gradually developed until by the close of the century it had largely replaced the Le Blanc process.

It is the ammonia-soda process, refined to the last degree, by which COLUMBIA Soda Ash is made. From the start this process found favor due to its relative simplicity, lower cost, and to the high degree of purity of the soda ash produced. This purity approaches the absolute in soda ash bearing the COLUMBIA trade-mark.

COLUMBIA

SODA ASH
CAUSTIC SODA
SODIUM BICARBONATE
MODIFIED SODAS
LIQUID CHLORINE
CALCIUM CHLORIDE

THE COLUMBIA ALKALI CORPORATION
BARBERTON • OHIO

NEW YORK
ST. LOUIS
CLEVELAND
CHICAGO
PITTSBURGH
MINNEAPOLIS
BOSTON
CINCINNATI
PHILADELPHIA

Courtesy of Valentine & Co.—Makers of Valspar.

Triple-Acting Stearates

In the making of paints and varnishes, stearates are used as flatting agents, as water-repellents, and as suspension mediums to prevent settling of heavy pigments. The unique properties of these chemicals particularly fit them to these as well as to many other industrial uses.

Let the ACID-BASE RATIO GOVERN YOUR USE OF STEARATES

Mallinckrodt Stearate Research increasingly shows the importance of the acid-base ratio when oils and solvents are treated with Aluminum Stearate. The three new grades (mono-, di-, and tri-acid) provide the complete range of acid-base ratios, to facilitate the manufacture of paints, varnishes, waterproofing materials, greases, and a wide variety of similar products.

The mounting popularity of Mallinckrodt Stearates attests their quality. They are carefully manufactured to definite chemical standards, assuring uniformity of each successive lot. Complete data on chemical and physical characteristics and uses of Mallinckrodt Stearates will be gladly sent to you on request.

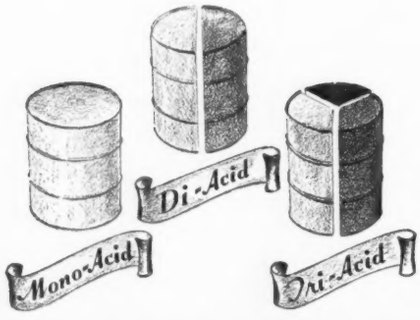
Numbered among these useful chemicals are:—

5 GRADES OF ALUMINUM STEARATE
2 GRADES OF CALCIUM STEARATE
2 GRADES OF ZINC STEARATE

Each grade has its own unique properties.

Industrial-Pharmaceutical Price List Sent on Request

Mark your calendar for Friday and Saturday, October 21 and 22, 1938, to attend the Third Annual Meeting and Golf Tournament of the Drug, Chemical and Allied Trades Section of the New York Board of Trade, Inc., at Skytop Lodge, Skytop, Pa.

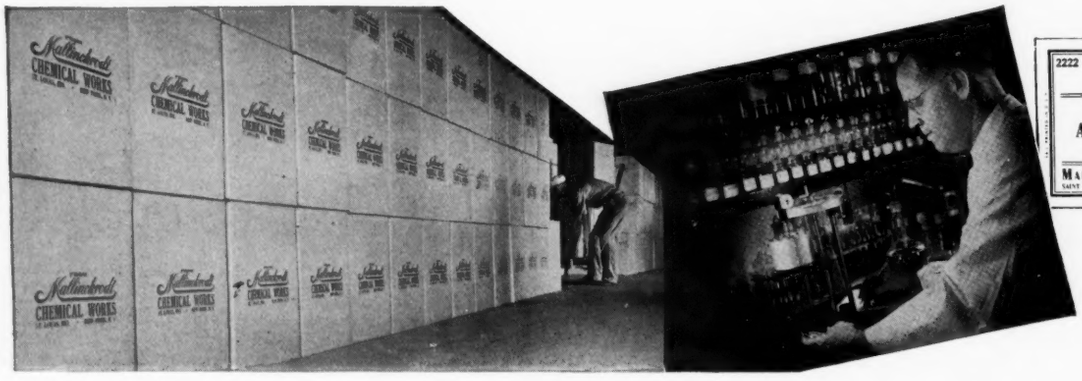


Mallinckrodt

CHEMICAL WORKS

2nd and Mallinckrodt Sts., St. Louis, Mo. 72 Gold St., New York, N. Y.

CHICAGO PHILADELPHIA MONTREAL TORONTO



CHARGES PRICE FIXING

Federal Trade Commission Complaint Filed Against 20 Lime Producers—Rapid Southern Chemical Expansion—Details of Dow Foundation Released—

Twenty producers of agricultural and chemical lime are charged in a complaint issued by the Federal Trade Commission with fixing and maintaining, by combination and agreement, the prices at which their product is to be sold to customers in the southeastern part of the U. S. where all of their plants are located. Although not organized as a formal trade association, the respondent producers, it is alleged, engage in their price-fixing practices with the aid and cooperation of their paid representative, Hal S. Covert, Knoxville, Tenn., whom the complaint also names as a respondent.

Complaint charges that the producers, acting in concert, and with the cooperation of Covert, are engaged in a conspiracy to restrain and suppress competition in the sale of lime to customers in the Southeast by fixing and maintaining uniform mill prices and uniform delivered prices, terms and discounts for their product.

In furtherance of their conspiracy, the respondent producers allegedly hold frequent meetings at which they discuss trade and competitive conditions in the lime industry and agree upon and establish trade policies to be followed and prices to be charged. According to the complaint, Covert calls and presides over the meetings, and acts as a clearing house for the exchange of information submitted by the producers, including reports as to sales of lime, mill and delivered prices and other data.

The acts and practices of the respondents, the complaint charges, have, among other things, increased the prices of agricultural and chemical lime and created in the respondent producers a monopoly in the sale of their product in the southeastern section of the country, and constitute unfair methods of competition in violation of the Federal Trade Commission Act.

The respondent producers and the places at which their plants are located are as follows:

Pine Hill Lime & Stone Co., Pine Hill, Ky.; Southern States Lime Corporation, Crab Orchard, Tenn.; Gager Lime Manufacturing Co., Sherwood, Tenn.; Knoxville Lime Manufacturing Co., Knoxville, Tenn.; Longview - Saginaw Lime Works, Inc., Long View and Saginaw, Ala.; Cheney Lime & Cement Co., Landmark and Greystone, Ala.; Ladd Lime & Stone Co., Cartersville, Ga.; Virginia Lime Products Co., Inc., Eagle Rock, Va.; Kimbalton Lime Co., Inc., Shawsville, Va.; Eagle Rock Lime Co., Eagle Rock, Va.; Williams Lime Manufacturing Co., Knoxville, Tenn.; Florida Lime Co., Ocala, Fla.; Dixie Lime Products Co., Ocala, Fla.; Keystone Lime Works, Inc., Keystone, Ala.; Green Bag Cement Co. of West Virginia, Lawton, Ky., and Kenova, W. Va.; M. J. Grove Lime Co., Bonsville and Frederick, Md., and Stevensville, Va.; Ripplemead Lime Co., Inc., Ripplemead, Va.; Riverton Lime & Stone Co., Riverton, Va.; Jesse Allen Lime Co., Burns, Tenn., and George L. Scott, Sr., trading as Alabaster Lime Co., Siluria, Ala.

Southern Chemical Industry

With southern states acquiring considerably more than half of the $400,000,000 worth of new plant investment made by the nation's chemical industries in the last 3 years, "test tubes are unlocking the door to unprecedented southern industrial progress," the Piedmont Chemical Society was told at Amherst, Va., on Oct. 3.

Reviewing major accomplishments of chemical-producing and chemical-process industries, Don B. Mason, chemical engineer of the Freeport Sulphur Co., called attention to the dominant part being played by the southern region in their expansion and growth. He also cited the outstanding record of achievement in direct contributions to economic progress made by these industries which are expanding operations and investments along the southern industrial frontier.

The recent southwide growth of these industries which rank high in steadiness of employment, payrolls, research, earnings and aids to higher living standards accelerates a long-time trend, Mason pointed out. In 1922, only 22% of the entire chemical industry was located in the South, and by '33 it had been increased to about 30%. Then for the years '36-'37, considering only new investments of $100,000 or more, the South got $186,326,000 worth out of the national total of $350,000,000.

The value to the South of having its recent and future industrial progress founded on expanded chemical and process industries was shown by Mason by citing the favorable "progress ratio" for chemicals compared to other leading industries over a wide range of economic yardsticks. Based on averages for '25-'29, compared with averages for '33-'37, chemicals easily topped the field in employment "progress ratio" with an index of 131.8 (the "composite" figure being 100), while foods were next, at 121.4, followed by meat packing, 119.4, and automobiles, 115.2. In payrolls, chemicals' improvement index was 144.3, against 130.1 for foods, 128.2 for meat packing, 119.6 for automobiles and 123.3 for leather.

Similarly in other tables, such as hourly and weekly earnings, industrial corporation profits, industrial production, and wholesale price reductions, the progress ratio showed greater improvement for chemicals than for the average of all leading industries.

Details of Dow Foundation

Details were revealed last month regarding the establishment of a trust fund by Mrs. Herbert H. Dow, which is to be used "exclusively for religious, charitable, scientific, literary or educational purposes for the public benefaction of the inhabitants of the City of Midland and of the people of the State of Michigan . . ."

The charitable trust set up by Mrs. Dow is known as "The Herbert H. and Grace A. Dow Foundation," and was established "in memory of her late and revered husband, Dr. Herbert H. Dow, and in token and esteem of the mutual friendship which has always existed between the members of the Dow family and the citizens of the City of Midland."

The foundation is incorporated as a non-profit trustee corporation under the laws of Michigan. Since its establishment in December, '36, donations in the amount of $4,000.00 have been made out of the income of the trust fund.

The first donation was made to the Midland swimming pool and band shell and was followed by a number of donations today to churches and a substantial donation to the Carnegie library.

When first started the fund contained 100 shares of Dow Chemical common stock. This has been added to from time to time by Mrs. Dow until today it contains 2500 shares of stock with a current value of about $325,000. At current dividend rates the income is about $7,500 annually. The gift to the foundation is outright and irrevocable, and according to Mrs. Dow's plan may be increased from time to time.

To Serve Midland

Speaking of the uses to which the money will be applied, Mrs. Dow requests the trustees "to favor charitable institutions located in or serving the City of Midland and its environs," and that the "stock be kept intact and only the income thereof be expended . . ."

All 5 of the Dow children—Mrs. Ruth A. Doan, Willard H. Dow, Alden B. Dow, Mrs. Margaret G. Towsley and Mrs. Dorothy D. Arbury—will act as trustees of the foundation and will serve without compensation. The officers of the foundation are: Willard H. Dow, president and treasurer, Alden B. Dow, vice-president, and Mrs. Doan, secretary.

Riley Sells Interest in Barium Reduction

J. B. Pierce, A Former Vice-President, Is the Purchaser—Landis To Receive Perkin Medal—Benger, du Pont, Speaks Before Trade Association Executives—

The Riley family interest in the stock of the Barium Reduction Corp., together with that of A. L. Spengler, has been sold. J. B. Pierce, Jr., a former vice-president, was the purchaser. James J. Riley retires as president and Mr. Spengler as vice-president. Their successors will be elected at an early date.

Mr. Riley was formerly in the high explosives business in Canada, but after their plant near Montreal blew up with the loss of a million lbs. of TNT in the autumn of '17, he came first to Washington in '18 and the next year, '19, reorganized the old Rollin Chemical Co. at South Charleston, W. Va. This ultimately became the Barium Reduction Corp. in '23 and Mr. Riley was its first president.

The company is now a leading American maker of barium chemicals. Mr. Riley at present will continue to reside at Charleston, W. Va.

'38 Perkin Medalist

Dr. Walter S. Landis, vice president of the American Cyanamid Co., inventor of a nitric acid process and the holder of some half a hundred patents on other chemical processes, has been awarded the

DR. WALTER S. LANDIS

Perkin Medal for '38, it was announced Oct. 4 following a meeting of the Perkin Medal Committee at the Chemists' Club in N. Y. City.

Dr. Landis has been the recipient of a number of other honors bestowed by the scientific world, including the Chemical Industry Medal for '36. The new Perkin Medalist is 57 years old and is a native of Pottstown, Pa. He graduated from Lehigh in '02 and displayed ability as metallurgist and chemist during his early years. He later taught at Lehigh and in '22 received his doctor of science degree from the same university.

Dr. Landis is president of the Chemist Advisory Council, and is a widely recognized authority on inflation. Dr. Landis has been a member of the consulting board of editors of CHEMICAL INDUSTRIES for a number of years.

How Chemistry Helps

Dr. Ernest Benger, du Pont general assistant chemical director, told members of the American Trade Association Executives at their meeting in Pittsburgh last month how industrial research has opened up avenues of employment through the development of new industries; lightened physical labor and reduced the number of working hours necessary to earn a living; aided in the conservation of natural resources; created synthetic products which make this country independent of foreign sources of supply for many vital materials; added to the richness of life through the development of new materials, which contribute to comfort and safety, and aided in the prevention and cure of diseases.

In New Positions

Dr. B. F. Buchanan, formerly instructor in the Dept. of Chemistry of Iowa State College at Ames, Iowa, recently joined the staff of the technical service division of American Maize Products at 100 E. 42nd st., N. Y. City. Dr. Buchanan will be actively engaged in food research.

Effective Sept. 19th the duties in connection with purchases for Armour Fertilizer Works, formerly taken care of by George C. Venard, were assumed by H. C. Moore.

Obituaries

John H. Acheson, 44, head of the Acheson Industries, Inc., N. Y. City, on Sept. 21. He was a son of the late Dr. Edward G. Acheson, founder of the Carborundum Co., and Acheson Graphite Co., which was subsequently merged with Union Carbide & Carbon. Survivors include a son, his mother, 3 sisters, and 3 brothers, Edward G. Acheson, Jr., N. Y. City; George W. Acheson, Newton, N. J., and Howard A. Acheson, president of Acheson Colloids Corp., Port Huron, Mich.

Mrs. Jacob Schoellkopf, 77, wife of the former head of the Schoellkopf Aniline & Chemical Works, Buffalo, on Sept. 16. She is survived by her husband, a son, and two daughters.

William E. Valliant, 69, a prominent figure in fertilizer circles for years, died on Sept. 23 after undergoing an operation in a Baltimore Hospital. In '20 he organized the Valliant Fertilizer Co., Laurel, Del., and became chairman of the board. Six years later he organized the Dorchester Fertilizer Co. and was president of this Co. until his retirement in '36. For years he was very active in N.F.A. affairs.

As we go to press one large sulfur producer announced that the price of sulfur on new contracts has been reduced from $18 to $16 a ton at the mine and from $22 to $20.50 in N. Y. Export sulfur has been lowered $1. With copper at 10½c manufacturers of copper sulfate have raised the carlot quotation to $4.40 per 100 lbs.

Porcel Corp. Formed

Attapulgus Clay Co. and American Cyanamid & Chemical have formed the Porcel Corp. to produce "Porcel" bauxite adsorbents. Attapulgus Clay, 260 S. Broad st., Philadelphia, will be sole sales agent for Porcel.

To Appear Before NLRB

The Midland Chemical Workers' Association at a meeting held last month decided to send Walter B. Brown, the association's attorney, to make an oral appeal before the National Labor Relations Board.

The appeal will be made against an adverse NLRB ruling made after a 17-day hearing ending last April naming Dow Chemical respondent and the MCWA co-respondent. The MCWA believes that the preponderance of testimony during the hearing is in its favor, and will base its appeal upon this contention.

Fiberloid Now Plastics Division

The Fiberloid Division of Monsanto Chemical henceforth will be known as Plastics Division, Monsanto Chemical Co., according to an announcement by John C. Brooks, vice-president in charge. Fiberloid was acquired by Monsanto on April 1, its former management and personnel being continued without change by Monsanto.

"The growing importance of the Indian Orchard plant as a supplier of plastics to the automotive, radio and other important industries warrants the change to a name of broader coverage," Mr. Brooks said.

The Plastics Division's national representation has been expanded to the point where district offices are maintained in N. Y. City in the R.C.A. Bldg.; Chicago in the Tribune Tower; St. Louis in the Monsanto Bldg.; Detroit in the Union Guardian Bldg.; and Los Angeles at 605 W. Olympic blvd.

Dow Holds First Dowclene Convention

Eighty Distributors of Dow Dry Cleaning Solvents Attend 3-Day Meeting at Midland—Glyco Products Appoints New Foreign Distributors—Warwick Chemical Appoints Alex C. Fergusson as a Distributor—Other News of the Chemical Specialty Fields—

News of the Specialties

Vice-President and General Sales Manager, Leland I. Doan, Dow Chemical, was the principal speaker at the 3-day first annual Dowclene distributors' convention held in Midland last month. Mr. Doan's subject was "What We Expect to Accomplish at the Dow Dry Cleaning Solvent Distributors' Conference."

R. A. Brewer, of MacManus, John, and Adams, Inc., advertising firm, presented the '38-'39 merchandising campaign for dry cleaners, and W. F. Stumpfig, advertising manager of the company, described the method of handling the campaign to dry cleaners and distributors.

The 80 representatives attending heard a number of Dow technical men deliver papers on various phases of the dry-cleaning field. The convention was climaxed by a banquet with the principal speaker John S. Bugas, representative of the Federal Bureau of Investigation, talking on the subject of crime. Group photograph of those attending the convention appears on page 414.

Glyco Appoints Representatives

Glyco Products, 148 Lafayette st., N. Y. City, reports the appointment of the following representatives for its line of specialty chemicals, emulsifying agents, synthetic waxes and resins, etc.:—M. Romulo Vildoso, Casilla Correo 26, Calle Potosi 137, La Paz, Bolivia; R. R. Haagenson, Postboks 582, Oslo, Norway; Einar Holmark, Vesterport 320, Copenhagen V, Denmark; Tuteur & Co., 30 Rue du Marche-aux-Poulets, Brussels, Belgium; and Eugen Boll, Paradiesstr 1, St. Gallen, Switzerland. Most of these arrangements were negotiated by President Edward Rosendahl during his trip abroad this past summer.

Represents Warwick Chemical

Alex C. Fergusson, Drexel Bldg., Philadelphia, one of the oldest distributors of chemicals in the U. S. has been appointed sales representative of Warwick Chemical. Territory will include all of Pennsylvania, Maryland, Delaware and part of New Jersey and West Virginia.

Water Lane, who has been located at the office of Warwick Chemical in West Warwick, R. I., is going to Philadelphia to work with the Fergusson organization as factory representative.

Hereafter, Warwick Chemical will carry a stock of chemicals in Philadelphia in addition to the stocks which they already carry in their Allentown and Wilkes Barre storehouses.

In New Plant

Wisconsin Chemical Products Co., Milwaukee, Wisc., has moved into its new plant. Company manufactures leather finishes. President of the firm is Roland A. Wiethaup, former plant superintendent for Pfister & Vogel Leather and also previously with B.B. Chemical Co., Cambridge, Mass.

Whitmoyer Expansion

Whitmoyer Laboratories, Inc., Myerstown, Pa., large manufacturer of specialties, has moved to its new location, one mile west of the Borough of Myerstown. Manufacturing capacity has been increased 5 times the old capacity and an additional 18,000 sq. ft. of floor space has been added. New location includes 12½ acres of land and approximately 3,000 ft. of private railroad siding. C. W. Whitmoyer is president.

Tossey Dies

Frank Tossey, 56, president since '10 of Ruby Chemical, Columbus, Ohio, died Sept. 13.

Lead Residue Raised

Quantity of lead spray residue to be permitted on interstate shipments of fruit under the Food and Drug Law has been raised to .025 grain per lb. of fruit by Secretary of Agriculture Wallace.

Rose at Home Office

Harold W. Rose returns to the home office of Warwick Chemical, West Warwick, R. I., where he resumes charge of sales in addition to his duties as vice-president of Impregnole Corp. Mr. Rose has been located at 580 5th ave., N. Y. City, which is the office of the Impregnole Corp., a subsidiary of Warwick Chemical.

News of the Specialty Companies

Lawrence-McFadden Co., manufacturer of wood-finishing materials, is in a larger plant at State rd. and Shelmire st., Holmesburg, Pa. (near Philadelphia).

The Dixie Specialty Co., Tampa, Fla., suffered a $12,000 fire loss on Sept. 7.

Lustre Chemical, Rochester, N. Y., is rushing to completion a modern plant to take the place of the one destroyed by fire last November. Founder and president, Milton J. French, states plant will cost $30,000. Facilities for making 1,500 gals. of concentrated bleach a day will make the Rochester concern the largest between Detroit and N. Y. City.

Fred J. Arthurs, previously with the Larkin Co., Buffalo, N. Y., has taken over the Larkin industrial chemical division and will operate it as his own business. Space has been taken in the Larkin Bldg., 680 Seneca st.

Harris-Seybold-Potter, Cleveland, reports mounting sales for its new etching compound used in lithographing and printing work.

John Lowe, president of Lowe Chemical, Nashville, is celebrating his 50th year in active business. Company is one of the large manufacturers of household specialties in the south.

Clorox's New Plant

Clorox Chemical, Oakland, Calif., manufacturer of the well-known household bleach by the same name, is receiving bids for another plant to be located at 51st st. and Merrimac ave., Chicago. Probable cost is given at $300,000. Clorox for the year ended June 30th reports a profit of $329,050 as against $359,141 in the year previous.

New Specialty Companies

The Cementex Co., 336 Canal st., N. Y. City, to make latex adhesives and other latex specialties. Robert J. Kenny heads the firm. The Mid-Continent Chemicals Corp., 6805 N. Clark st., Chicago, will handle the new company's line in mid-west territory.

A new firm, the Clem Chemical Co., a subsidiary of the F. W. Fitch Co., Des Moines, to make two new products for preventing runs in women's silk hosiery. One of the products, Hose-Re-Life, is a substance which is used to prolong life and prevent runs in hosiery, while the other is Stop-A-Run. F. W. Fitch is president.

Pioneer Chemical Products, 146 W. Adams st., Phoenix, Ariz., to make a radiator cleaner. James Goller is president.

Wyoming Valley Chemical, Carpenter st., Luzerne, Pa., to make chemical specialties and sanitary supplies. John J. Minelli is president.

Textile Chemical Products, Greensboro, N. C., is being reorganized under the name of Morton Chemical.

LAUNDRY MANAGER:

"COST DECREASED 50% AND GETTING WHITER WORK"

PACKING PLANT SUPERINTENDENT:

"METSO CUT 25% OFF TIME REQUIRED IN WASHING REFRIGERATOR CARS"

PLATING SHOP FOREMAN:

"CLEANING SEQUENCE REDUCED FROM TEN OPERATIONS TO FIVE"

DAIRY MANAGER:

"GOES THREE TIMES AS FAR AS FORMER CLEANER"

PROFITS FROM METSO CLEANING *speak for themselves!*

ARE YOU now using a half-hearted cleaner that is time consuming, expensive and only partially effective? Know the savings in cleaning with Metso detergent. Metso is accurately balanced alkali and silica, developed by us under U. S. Pats. 1898707 and 1948730.

Here are seven important advantages that proved Metso an ideal cleaner in dozens of industries.

1. Uniform cleaning strength, long sustained at a high degree of activity insures thorough cleaning.
2. Metso has the necessary ingredient to curb corrosiveness on sensitive surfaces.
3. Metso wets dirt quicker which speeds removal.
4. An excellent emulsifier which leaves no greasy film.
5. Suspends grease and dirt in solution and prevents them from settling back on clean surface.
6. Completely free rinsing.
7. Economical. Metso is a basic alkali sold at a basic alkali price.

FREE—*Send for a sample can of uniform quality Metso, and check these points in a cleaning job in your plant.*

METSO CLEANERS

METSO CRYSTALS • METSO 22
METSO GRANULAR • METSO 66
METSO FINES • METSO 99
U.S. Pats. 1898707 & 1948730

PHILADELPHIA QUARTZ CO.

General Offices and Laboratory: 125 S. Third St., Philadelphia, Pa.
Chicago Sales Office: 205 W. Wacker Drive. Stocks in 60 cities.
Sold in Canada by National Silicates Ltd., Toronto, Ont.

Demand For Industrial Chemicals Expands

Trucking Strike Cripples Deliveries in the Metropolitan Area—Aqua Ammonia Carboy and Drum Schedule Revised In Eastern States—Copper Oxides Advanced—Tin Salts Higher—Caustic Soda Shipments Heavy to the Rayon Producers—

Heavy Chemicals

It is a wonder that the demand for industrial chemicals showed any signs of expansion in the past month what with several adverse influences including the threat of a new world war, floods and hurricanes in the New England states and in Charleston, S. C., and a major trucking strike in the Metropolitan N. Y. area. Yet business was definitely better. The steady improvement in the call for industrial chemicals indicates that the consuming industries are rapidly advancing production schedules. The fall outlook is highly encouraging.

September price changes were largely caused by advancing metal markets. The stronger position in copper forced a ¼c increase in the copper oxides, the new basis being 15½c for the red and 15c for the black. Tin straits advanced sharply in the past 30 days and the necessary readjustments were made in sodium stannate, tin crystals, and the tetrachloride. Antimony took on a firmer status late in the month and a ½c advance brought current quotations to 11¾c. African manganese dioxide was lowered to bring the price in line with Caucasian.

Very early in the month quotations were lowered ¼c for ammonia in carboys and drums in the Atlantic seaboard states including Maine, New Hampshire, Vermont, Rhode Island, Massachusetts, Pennsylvania, New Jersey, New York, Maryland, and Delaware. The new prices are based on 5c for 26 degrees in carboys and 2c in drums in carlots with a ¼c additional for l.c.l. An additional ¼c differential prevails for the states of Maine, New Hampshire, and Vermont. Quotations on carboys are f.o.b. shipping point and drums are delivered. No change was announced in tankcar or tankwagon quotations.

The ¼c decline in carbon tetrachloride was briefly reported in the September issue. The states of Iowa, Kentucky, Minnesota, Missouri, North Carolina and Tennessee have been included in the freight allowed area East of the Mississippi and North of the Ohio River.

Improved Outlook For Consumption

The news from the chemical consuming industries for the most part has been encouraging. Plating chemicals are moving out in fair-sized quantities now that the automotive companies are opening their assembly lines for '39 models. The spurt in rayon has caused an appreciable increase in caustic shipments. Bichromate producers report that tanners and dry-color producers are taking heavier quantities. All of the textile divisions are busy and these are large consumers of a wide variety of chemicals. The glass industry shows signs of improvement, but so far is still well below the corresponding period of '37, with the result that soda ash shipments are still below normal. Paper production, other than newsprint, is gaining. Output other than paperboard and newsprint, was just under 77% of capacity in August, against 83% in the same month a year ago. August rubber consumption of 38,170 tons was better than generally expected.

The rise in steel operations has helped sulfuric consumption. All of the mineral acids are moving in better volume. Demand for copper sulfate is still heavy and stocks are still below normal. Chlorine and chlorine compounds were in heavy demand in the stricken New England areas. All water treating compounds, chlorine, alum, etc., have moved in good volume during the summer period.

No contract price readjustments of importance were announced previous to the beginning of the final quarter. So far no announcements have been made on prices for the coming year, although they are now expected at any moment. The general feeling is that relatively few changes are likely despite the fact that manufacturing and labor costs have risen in the past year. With the rising optimism prevailing, the contract season probably will be a more satisfactory one to sellers and buyers alike than was the case a year ago when manufacturing activity was very definitely declining rapidly.

Smith Succeeds Douglas

Harry P. Smith, vice-president and treasurer of the George Chemical Co., N. Y. City, has been elected president of the company, succeeding C. V. Douglas, who resigned last month to become Metropolitan N. Y. representative for Diamond Alkali. Mr. Douglas' new offices are located in the N. Y. Central Bldg., 230 Park av.

Employees Buy Rolls

A group of employees of Rolls Chemical, Buffalo distributor, announces purchase of the company from the estate of Harold J. Rolls, who died June 8th. They have incorporated the concern under the name of Rolls Chemical Co., Inc.

Important Price Changes

ADVANCED

	Sept. 30	Aug. 31
Antimony metal	$ 0.11¾	$ 0.11¼
Copper oxide, red	.15½	.15¼
Black	.15	.14¾
Sodium stannate	.30	.29
Tin crystals	.35	.34½
Metal	.44½	.43
Tetrachloride	.22½	.22

DECLINED

Ammonia, carboys	$0.05	$0.05¼
Manganese dioxide	54.50	57.00

Donald D. Bradley, who had been manager of technical sales for Rolls, is the new president and treasurer. Other officers are: Charles H. Throm, vice-president; Raymond G. Calhoun, secretary; and Gerald M. Cooper, assistant treasurer. Mr. Bradley, Mr. Throm and Mr. Calhoun are the directors.

Monsanto's "Phosphotex"

Production of tetrasodium pyrophosphate on a commercial basis in sufficiently large quantities to supply the requirements of soap manufacturers has been attained by Monsanto Chemical, R. F. Richard, general manager of sales, Phosphate Division, announced on Oct. 2.

Tetrasodium pyrophosphate—now tradenamed "Phosphotex" by Monsanto—has been in the process of development commercially for the last several years in Monsanto's research laboratories in Anniston, Ala., and Dayton, Ohio, and now is being produced in large tonnages as the joint effort of the Monsanto phosphate plants at Anniston and Columbia, Tenn.

Ready acceptance of Phosphotex as an ingredient of laundry soaps made by several of the larger manufacturers has followed the sizeable advertising campaigns sponsored by these users, Mr. Richard said, and indications are that many other soap makers will begin using it in their products.

Chief advantages of Phosphotex in laundry soaps, according to Mr. Richard, are elimination of the ring around laundry tubs, wash basins, and bath tubs, the elimination of tattle-tale gray in linens and clothing, doubling the amount of suds, longer lasting suds, an end to dish-pan hands, and cleaner, truer colored, sweeter smelling garments.

From the manufacturers' standpoint, Monsanto has so developed its production technique that Phosphotex is supplied at a price that permits the soap maker to use it in his product without increasing his manufacturing cost and therefore his selling price to the ultimate consumer.

ACIDS

Phenol . Ortho Cresol . Cresol U. S. P. . Cresylic Acid . Meta Para Cresol . Xylenol . High Boiling Tar Acids.

CHEMICALS

Acenaphthene . Anthracene . Carbazole . Fluorene . Methyl Naphthalene . Phenanthrene . Naphthalene.

OILS

Neutral Oil . Tar Acid Oil . Light Oil . Creosote Oil . Coal Tar Oil . Brushing Oil.

INDUR PLASTICS

Insulating Varnish . Laminating Varnish . Molding Powder . Molding Resin.

SPECIAL PRODUCTS

Carbon Coke . Coal Tar Paints . Coal Tar Pitch . Bituvia Road Tar . Flotation Oils . Pipe Coating . Transote . Roofing Felt, Pitch, and Tar.

Reilly
COAL TAR PRODUCTS

Reilly
COAL TAR PRODUCTS

To users of coal tar products and derivatives, Reilly offers a dependable source of supply—made convenient and accessible by 15 plants located in leading industrial centers throughout the United States. Reilly products are known everywhere for highest quality, uniformity and strict adherence to specifications . . . Address our nearest office for information relating to your requirements.

REILLY TAR & CHEMICAL CORPORATION

Executive Offices: Merchants Bank Building, Indianapolis, Indiana

2513 S. DAMEN AVENUE, CHICAGO, ILLINOIS 500 FIFTH AVENUE, NEW YORK, N. Y. ST. LOUIS PARK, MINNEAPOLIS, MINN.

FIFTEEN · PLANTS · TO · SERVE · YOU

Refined Naphthalene Reduced 1¢ per Lb.

Improved Demand for Coal-Tar Solvents From the Coatings Industry—Benzol Continues Firm—Phenolic Resin Producers Expand Operations—Importers Reduce Quotations on Cresylic—Shipments of Dyes to Consuming Industries Improve—Expansion in Creosote Volume Anticipated—Byproduct Coke Activity Again Gains—

Coal-tar Chemicals

Gradual betterment is reported in most divisions of the coal-tar chemicals. It is now quite apparent that stocks of most items in consumers' hands are at a very low point forcing them into the market in ever increasing numbers.

The coatings industry, after a disappointing August and part of September, is stepping up production schedules rapidly to meet the requirements of the automotive producers. It is expected that the assembly lines in the Detroit area will be at maximum output by Nov. 1. This has increased quite noticeably the call for coal-tar solvents. The improved outlook has also had a wholesome effect on the resin and plastic manufacturers as the automobile manufacturers are now important consumers of these products. The resin producers have been abnormally slow for months.

Benzol tonnages are still heavy, but the fear of shortages in certain sections has been largely eliminated because of the higher rate of activity in the byproduct coke industry which has made available larger quantities of all coal-tar chemicals. Phenol and cresylic are firmer, largely because of the improvement in demand for phenolic resins. Creosote oil was quiet, but increased consumption is anticipated shortly because of rehabilitation requirements in the storm-swept areas on the Atlantic Coast. The heavy use of disinfectants in these areas over the past month has cut into manufacturers' supplies. As a result a slightly improved demand for tar acid oils was in evidence.

Activity in the textile, tanning, paper and rubber fields has expanded to such a degree that dyes are moving out in more satisfactory volume and intermediates are in better demand.

Imported Naphthalene Declines

Price changes last month were relatively few. Crude naphthalene lost further ground and is now quoted at $1.40. No change was made in the quotation for domestic crude, but the market is largely nominal with little material actually changing hands. Of decided importance, however, was the 1c decline in refined grades of naphthalene placed in effect early in September. Balls or flake are now 5¾c in barrels; 16-oz. packages are 6½c; 12-oz. packages are 5¼c. Chipped or crushed in barrels are now quoted at 5¼c; rice, crystal or powdered are 5¾c. All prices are f.o.b. works.

Importers of cresylic reduced quotations last month after a relatively long period of comparative price stability. Pale acid was reported at 65c and dark material at 60c, in each case a reduction of 10c from the previously quoted prices.

Light oil recovery in August totalled 10,284,559 gals., as compared with 8,978,736 gals. in the preceding month and 18,890,966 gals. in the corresponding month of '37. In the first 8 months output reached 80,022,837 gals., against 140,611,027 gals. in the same months of '37. August tar production totalled 31,312,515 gals., as compared with 27,355,190 gals. in July and 57,516,825 in the corresponding month a year ago. For the first 8 months of '38 and '37 the figures are 243,643,417 gals. and 440,293,367 gals., respectively.

Byproduct Coke Output Rises

Continuing the upswing started in July, production of byproduct coke in August totalled 2,494,471 tons, an increase of 14.6% over the 2,176,212 tons produced in July. August, '37 output amounted to 4,571,062 tons. Output for the first 8 months of the current year has reached 19,387,629 tons as against 34,688,596 tons in the corresponding period of '37.

August benzol production was reported at 5,585,000 gals., a gain of 17.1% over the 4,769,000 gals. turned out in July. August, '37, output was 11,144,000 gals. For the calendar year to date benzol production has reached 42,785,000 gals., as against 82,827,000 gals. in the corresponding period of last year.

Phenol Plant Near Completion

John F. Snyder, secretary and treasurer of General Plastics, N. Tonawanda, N. Y., reports that the new synthetic phenol plant costing $100,000 will be in operation before the end of the year.

Calco Wins First Award

At the National Industrial Advertisers Association Convention held in Cleveland on Sept. 21-23, the '38 advertising campaign of Calco Chemical was awarded a first prize.

Roberts an AHCO Vice-President

Thomas H. Roberts has been elected a vice-president and technical director of Arnold-Hoffman & Co., Providence, R. I.

Important Price Changes

ADVANCED

	Sept. 30	Aug. 31
None.		

DECLINED

Acid cresylic, imp., pale	$0.65	$0.75
Imp., dark	.60	.70
Naphthalene, crude, imp.	1.40	1.50
ref'd balls, flakes, bbls.	.05¾	.06¾
16-oz. pkges.	.06½	.07½
12-oz. pkges.	.05¼	.06¼
chipped, crushed, bbls.	.05¼	.06¼
rice, crystal or powd., bbls.	.05¾	.06¾

Mr. Roberts was one of the early pioneers in the dye field, opening a plant in '15 when supplies from Germany were cut off by the World War. He joined the AHCO organization in '26 as manager of the company's dyestuff factory.

A. A. T. C. & C. Meets Dec. 2

The annual meeting and convention of the American Association of Textile Chemists and Colorists will be held at the Atlanta-Biltmore, Atlanta, Ga., on Dec. 2-3.

Du Pont Changes

The following changes in the Organic Chemicals Dept., Dyestuffs Division of du Pont have been announced. S. M. Conn, formerly district sales manager in Wilmington, has been transferred to the N. Y. office as sales manager. G. E. Gillespie, formerly manager of the N. Y. office, has been transferred to Wilmington as special assistant to A. R. Chantler.

Study of Meters

Dr. E. R. Weidlein, Director of Mellon Institute, Pittsburgh, Pa., announces establishment of an Industrial Fellowship on meter technology by the Pittsburgh Equitable Meter Co. Among the first projects to be investigated are the adaptation of synthetic plastics as constructional material for liquid meters and the development of a satisfactory substitute for the present leather diaphragms in gas meters. Dr. R. L. Wakeman is to be the incumbent of this Fellowship.

Made a Division

Eastern Mineral Spirits Co., petroleum naphthas, N. Y. City, is now operated as a division of American Mineral Spirits Co. There will be no change in personnel or organization, and the address of the Eastern Mineral Spirits Co. in the various cities in which the company is active will remain unchanged.

MANUFACTURING
CHEMISTS
SINCE 1849

PFIZER QUALITY

ASCORBIC ACID

$C_6 H_8 O_6$

PFIZER I–Ascorbic Acid (Cevitamic Acid) is a white to yellowish-white fine crystalline powder; exceptionally free from metallic impurities and of excellent stability. It is derived from dextrose, or grape sugar, by carefully controlled processes which ensure its continued high purity and uniformity.

Pfizer I–Ascorbic Acid meets all the American Medical Association tests for Cevitamic Acid, as published in New and Non-Official Remedies for 1937.

CHAS. PFIZER & CO., INC.

NEW YORK
81 MAIDEN LANE

CHICAGO
444 W. GRAND AVE.

Mercury Advanced $2; Mercurials Unchanged

Bismuth Subcarbonate, Subgallate, and Subnitrate Advanced In Price—Competition Drives Cadmium Metal Down—Seasonal Decline In Citric Acid Consumption—Sulfanilamide On Dangerous List—Trucking Strike Halts Metropolitan N. Y. Deliveries—Aromatic Chemicals Quiet—

Fine Chemicals

The market for fine chemicals, pharmaceuticals, and aromatic chemicals was largely of a routine nature in the past 30 days. The fear of an outbreak of hostilities abroad had a strengthening effect on a number of important items. Prominent in this group were mercury and glycerine. The firmer tone in the metal provided a stability to the mercurials which has been lacking for several weeks. At the month-end, mercury was quoted at $77 per flask, a net gain of $2 in the 30-day period.

Prices on bismuth subcarbonate were advanced 20c to the basis of $1.53-$1.56; subgallate was raised 25c to $1.58-$1.63; while the subnitrate was "upped" 15c to a basis of $1.33-$1.36. No other salts of the metal were changed, and the price of the metal itself remained unaltered. Manufacturers of the salts reported that the price revisions were made to put the items on a more profitable basis in relation to the current metal price.

A rather severe state of competition in cadmium came out into the open in the past month, driving the metal down to 95c, but no price revisions were made in cadmium compounds.

Demand for acetylsalicylic acid failed to show much seasonal improvement, but this condition is expected to change shortly as the winter season approaches. Seasonal decline in the consumption of both citric and tartaric was reported. The reduction of 2c for completely denatured alcohol was not extended to pure alcohol, but the competitive situation in the item is still unchanged. Menthol lost ground in light trading and at the month-end was quoted at $3.10 per lb. Camphor, on the other hand, is in somewhat better demand and prices are firmer.

Much interest in the fine chemical field centered around the ruling of the Food and Drug Administration concerning sulfanilamide, preparations containing it, or related compounds. While recognizing the value of the product, the opinion was expressed that serious danger existed when it was distributed for indiscriminate use by the general public.

Trucking Strike Cripples

The trucking strike in the Metropolitan N. Y. area late in September seriously crippled deliveries and for 4 days practically all movement of goods was halted, even those consigned to hospitals and for delivery to the storm-stricken New England areas. Fortunately manufacturers had had ample warning of the impending strife and had urged customers to stock up on important items. Conditions at the month-end were just about back to normal.

Aromatics Quiet

The market for aromatic chemicals was without any outstanding price change. Consumption was fair. A flurry of buying took place when the European situation became acute brought about by fear that imported material might not be available.

Merck Receives Award

The Committee of Judges of the Direct Mail Advertising Association has selected Merck & Co., Inc., manufacturing chemists, Rahway, N. J., as one of the 50 Direct Mail Leaders of '38, according to an announcement made by Douglas Wakefield Coutlee, advertising director of the Company. Award was made on the basis of outstanding direct mail literature employed in the professional promotion of several Merck medical products.

Abbott's 50th Year

In observance of the 50th anniversary of its founding, Abbott Laboratories, pharmaceutical manufacturer, North Chicago, Ill., announces completion of a new research laboratory building providing greatly expanded facilities for the chemical, bacteriological, medical and pharmaceutical research activities of the firm. All pharmacological work is conducted in a modern, air-conditioned building erected some time ago especially for this purpose, while the developmental laboratories occupy still another building.

Fall Board of Trade Meeting

The 3rd annual fall meeting and golf tournament of the Drug, Chemical and Allied Trades Section of the N. Y. Board of Trade will be held at the Skytop Club, Skytop, Pa., Oct. 21-22. Matters of interest concerning recent legislation will be discussed by competent speakers. A full sports program has been arranged and a special ladies program as well. Reservations should be made promptly with the Section's secretary, Ray Schlotterer, 41 Park Row, N. Y. City.

Important Price Changes

	Sept. 30	Aug. 31
ADVANCED		
Bismuth subcarbonate	$ 1.53	$ 1.33
subgallate	1.58	1.33
subnitrate	1.33	1.18
Mercury metal	77.00	75.00
DECLINED		
Cadmium metal	$0.95	$1.05
Menthol	3.10	3.20

The general regulations under the new Food, Drug, and Cosmetic Act are just about completed by the Food and Drug Administration. Copies will be available shortly and a public hearing will probably be held sometime in November at which those interested may appear and voice their opinions. The regulations do not go into effect until June, '39.

New Rubbing Formula

A new formula for denatured alcohol used in manufacturing rubbing alcohol has been developed by chemists of the Treasury Dept. and has been submitted to the technical committee of the alcohol industry for testing and comment.

International Acetylene Congress

The 13th International Congress of carbide, acetylene, oxy-acetylene welding and allied industries will be held in Munich, Germany, from June 25 to July 1, '39. The three preceding Congresses were held in Zurich in '30, in Rome in '34, and in London in '36. Dr. Schmitz, Chairman of the Board of Directors of I.G. will preside at the Congress.

Official inquiries should be directed to the office of the Congress in Berlin-Friedenau, Bennigsenstrasse 25, Berlin, Germany.

News of the F. T. C.

The Federal Trade Commission has ordered The Perfect Manufacturing Co., Inc., 3317 Madison rd., Cincinnati, to cease and desist from certain misrepresentations in connection with the sale of Kar-Nu, a liquid for finishing automobiles, and No-Flatz, a liquid preparation placed in automobile tire tubes for the purpose of preventing punctures. The respondent corporation sells its products under the trade names of Kar-Nu Co. and No-Flatz Co., respectively.

Opens St. Louis Office

Plastics Division, Monsanto Chemical, Indian Orchard, Mass., announces establishment of a St. Louis district sales and technical assistance office. Office is in the Monsanto Bldg., 1700 S. 2nd st., St. Louis. Joseph E. Gee, formerly of the Chicago staff, is in charge.

"Let it go, Sonny. About as much chance of finding that ball as there is of finding a speck of dirt in a carload of Niagara

Carbonate of Potash"

P.S. You'll find that Niagara Caustic Soda and Caustic Potash are exceptionally pure, too.

Niagara
ALKALI COMPANY
[illegible] EAST 42nd STREET, NEW YORK, N.Y.

Affiliated with Electro Bleaching Gas Co.
Pioneer Manufacturer of Liquid Chlorine

Completely Denatured Alcohol Down 2¢

Petroleum Solvents Steady—Amyl Acetate From Fusel Oil Reduced ½c—Diamyl Phthalate, Dibutyl Phthalate Off 1½c—Solvents In Better Demand—McGovern Urges "Council of Industrial Alcohol Users"—Butyl Alcohol-Acetone Plant Being Erected In Puerto Rico—

Solvents and Plasticizers

The severe competitive situation in industrial alcohol became more acute late last month culminating in a 2c reduction in completely denatured alcohol prices. New quotations are now 23c in tanks, 31c in drums in carlots, 34c in l.c.l. quantities to jobbers, and 36c to dealers and industrial consumers taking l.c.l. lots. In a way the decline was unexpected for this is the period of the year when because of seasonal influences shipments are expanding. Competition from methanol in the anti-freeze business is an important factor that may have influenced producers to reduce prices. Taking the most recent price readjustment into consideration completely denatured alcohol prices have declined about 20% in the last 9 months. The price change in C.D. alcohol was not extended to pure alcohol or to the specially denatured formulas.

Petroleum Solvents Steady

The market for petroleum solvents showed definite signs of improvement in the past 30 days. Movement of solvents into the coatings field was much larger than for several months past. Despite weakness in the gasoline markets prices of the principal petroleum solvents held firm and unchanged. The call for material from the rubber centers was also in much better volume. The price structure on drum quantities and tankwagon deliveries in the important industrial centers in the mid-west and along the Atlantic seaboard have not shown any change now for several weeks. The total consumption in September is said to have been well in excess of August's volume.

Competition was blamed for the ½c decline in amyl acetate produced from fusel oil. No change was made in the product produced from pentane. On the new basis technical is now quoted at 9½c in tankcars, 10½c in drums in carlot quantities, and 11c for l.c.l. quantities.

Diamyl phthalate quotations were reduced 1½c to 18c in tanks, 19c in drums in carlot quantities, and 19½c for l.c.l. lots. A similar reduction was made in dibutyl phthalate with the quantity prices the same as those for diamyl phthalate. An 8c decline was made in tributyl phosphate and the current market is 42c in l.c.l. lots.

Improved 4th Quarter Outlook

A fairly steady tone was reported in the other important lacquer materials including acetone, butyl alcohol, butyl acetate, ethyl acetate, etc. Consumption of solvents and plasticizers over the final quarter is expected to be the best 3-months period this year. Automotive producers in the Detroit area are pushing production of '39 models and by the end of the current month all of the assembly lines should be working at top-speed. Stocks of cars in dealers' hands are at an extremely low point which should help to keep the manufacturers busy at least over the balance of '38.

August Alcohol Statistics

August production of ethyl alcohol totalled 17,284,176 proof gals., as compared with 17,067,262 in August of last year. Output of completely denatured in August amounted to 1,502,022 wine gals., as against 1,813,306 in August of '37. At the end of August stocks totalled 809,403 gals., against 989,666 at the end of August last year. August production of specially denatured was reported at 6,343,681 wine gals., a slight gain over the 6,118,283 gals. produced in the corresponding month of '37. Stocks at the end of the month were also lower, the respective figures being 606,897 and 733,920 gals.

Rubber Industry Expands

Shipments of tires gained 2.5% in August over July. August production of 4,093,234 units, the highest month's production since September, '37, represented an increase of 22.1% above July and 2.8% above August, '37. Stocks at the month-end rose slightly (1.6%) over July total, but were 23% below those of August 31, '37. Other divisions of the rubber industry also showed considerable expansion. As a result, tonnages of most rubber compounding chemicals were in the best volume reported so far this year.

Pyroxylin-Coated Textiles In August

Shipments of pyroxylin-coated textiles expanded in August over July figures. Shipments of light goods amounted to 2,481,176 linear yds., as compared with 2,328,065 in July and 2,778,419 in August of '37; shipments of heavy goods in August amounted to 1,905,767 linear yds., as against 1,428,773 in July and 2,025,340 in August a year ago. Shipments of pyroxylin spread were reported at 4,815,305 lbs. in August as against 3,862,285 in July and 5,374,978 in August of '37. The respective totals for the first 8 months of '38 and '37 are given below:—

	1938	1937
Light goods	19,391,483	28,484,616
Heavy goods	12,428,906	16,787,724
Pyroxylin spread	32,862,564	48,233,153

Important Price Changes

ADVANCED

None.

	Sept. 30	Aug. 31
DECLINED		
Alcohol, comp. denat. tks.	$0.23	$.25
c. l. drs.	.31	.33
Amyl acetate, tech., drs.	.10½	.11
Diamyl phthalate	.19	.20½
Dibutyl phthalate	.19	.20½
Tributyl phosphate	.42	.50

Alcohol Council Urged

The Industrial Alcohol Institute can best serve the industry in all of its branches by allying itself with groups of alcohol users who are dependent upon the producers for their supply of pure and denatured alcohol, says Capt. James P. McGovern, general counsel for the Institute, in a letter to the board of directors.

Captain McGovern states he would recommend that the Institute consider sponsoring the formation of a cooperative body to be designated, for example, as "The Council of Industrial Alcohol Users." This would be composed of representatives of all scientific societies and trade associations concerned with the use of alcohol "as a chemical raw material."

Solvents From P. R.

The Federal Government is indirectly entering chemical manufacture through the erection of a plant in Puerto Rico for the production of butyl alcohol and acetone from molasses. Project is under the auspices of the Puerto Rican Reconstruction Administration. Plant, which is being constructed by the Lummus Co., a New York engineering firm, will be ready for operation early in 1939.

Plant is being erected by the Asociacion Azucarera Co-operativa Lafayette of Arroyo, Puerto Rico, one of the leading sugar producers there, whose output of sugar last season amounted to 32,459 short tons.

Puerto Rican sugar interests have been active in the alcohol industry and their production has been a growing factor recently in the markets for this solvent. The Co-operativa Lafayette project, it is reported, will have capacity for the output of about 3,500,000 lbs. of butyl alcohol and some 1,500,000 lbs. of acetone yearly.

Agricultural Chemicals

Little Interest In Raw Fertilizer Materials

Sulfate Automatically Advanced 25c—Potashes Now At List—Mixed Movement In Natural Ammoniates—Larger Supplies of Sulfate Available—Severe Crop Losses On Eastern Seaboard—August Tag Sales Down 21%—Dates For Southern Convention Announced—

Important Price Changes

	Sept. 30	Aug. 31
ADVANCED		
Ammonium sulfate	$27.25	$27.00
Blood, dried, N. Y.	3.00	2.75
Chgo., High-Grade	3.00	2.75
Bone 4½ & 50 Chgo.	28.50	27.00
Fish scrap, dried, ungrd.	3.30	3.25
Jap. Sardine meal	44.00	43.50
Nitrogen sol.	1.03	1.00
Tankage, grd., N. Y.	2.75	2.70
Ungrd., N. Y.	2.75	2.70
Fert. grade, Chgo.	2.65	2.55
DECLINED		
Calcium phosphate, dibasic, imp.	$0.77	$0.80
Lead arsenate, East	.11	.12½
Linseed meal	41.50	42.00
Nitrogenous mat., East	2.60	2.65
West	2.25	2.35
Tankage S. A.	3.10	3.25

Buys Full Control

Davison Chemical has absorbed the stock of the Oberphos Co., having purchased the last 7,750 shares of a total of 10,000 last month. Regarding the purchase last month, it was reported 5,500 shares were bought from the Koppers Co. at a reported price of $225,000. Remaining 2,250 shares were acquired on a cash basis.

Deaths of the Month

Wilbur W. Hubbard, president, The Peerless Fertilizer Co., Chestertown, Md., on Sept. 12 . . . James Ashby Moncure, 77, founder of the Richmond Guano Co., on Sept. 13 . . . Charles W. Bolgiano, 44, president, F. W. Bolgiano & Co., Washington, D. C., on Sept. 19.

Personal and Personnel

William G. Jarvis, manager of the Norfolk plant of Baugh Chemical, will have served that company for 50 years on Nov. 1 . . . Edward Butler, Jr., has been with the same firm for 63 years . . . Robert H. Engle has been appointed assistant agronomist for the N.F.A., taking the place of Dr. A. L. Grizzard who resigned recently.

Mullaly Elected

Arthur L. Mullaly, president, Advance Solvents & Chemical, has also been elected president of Synthetic Nitrogen Products, N. Y. City.

Mr. Mullaly has been associated with the chemical industry for many years, having been with Kuttroff-Pickhardt & Co., and at one time with H. A. Metz & Co., and also National Aniline.

The past month was a quiet one in the markets for fertilizer raw materials. Importers and consumers of foreign materials held their breath while the political leaders strove to avert war. Happily a solution of the problem was found.

On Oct. 1 the price of ammonium sulfate automatically advanced 25c a ton to a basis of $27.25 in bulk. At the end of September the 5% discount on potashes ended and prices are now at list. On Oct. 1 the price on nitrogen solution was advanced 1c and this with an earlier increase of 2c brought the current figure to $1.03. The steady increase in byproduct coking operations has removed much of the fear of a shortage of sulfate, particularly for October-November delivery. In some isolated cases in the South a premium of 50c a ton was being asked. August output of sulfate totalled 34,898 tons, an increase of 14.5% over July output. No outstanding changes were reported in nitrate of soda with prices firm and unchanged and little immediate buying interest being displayed.

The movement in organic ammoniates was mixed, some prices being higher, while others declined slightly from Aug. 31st levels. A slight flurry of buying came into the market when a European War seemed imminent, but this soon "petered out." The Chesapeake fishing season is about ended; sales in the Baltimore market have been few and far between in the past 30 days and the market is, therefore, largely a nominal one.

Domestic bone (4½ & 50) is now quoted at $28.50, c.i.f. Atlantic ports. Importers of foreign material are largely out of the market due to the lack of available steamer space. Imported dicalcium phosphate (precipitated) was reduced 3c a unit, to a basis of 77c. A firm tone was in evidence in the Baltimore superphosphate market.

The fertilizer industry was particularly interested in the severe storms which battered the Atlantic Coast for the best part of a week. Crop damage in the Middle Atlantic and New England states was specially severe. The same thing is true of the eastern end of Long Island. No really serious damage was sustained in the South.

August Tax Tag Sales Register Drop

Total tax tag sales in the 17 reporting states in August were 21% smaller than a year ago. This was due to a substantial decline in the Midwest, where August is normally one of the peak months of the year. Indiana accounted for the larger part of the decline although sales in that state were larger than two years ago.

Aggregate sales in the South were 9% above August, '37, but August is relatively an unimportant month from the standpoint of southern sales. The increase was due largely to one state, Virginia.

July Exports Down

Exports of fertilizers and fertilizer materials from the U. S. in July totaled 112,944 long tons, valued at $978,355. This represented declines of 25% in tonnage and 44% in value from July of last year. Nitrogenous materials, phosphate rock and potash were all exported in smaller quantity than a year ago. The only important increase was in superphosphate.

Downward Trend In Imports

July imports, totaling 57,773 long tons with a valuation of $1,351,213, were substantially below July of last year. The decline from '37 in imports of nitrogenous materials was small, an increase in sodium nitrate partially offsetting declines in other materials. There was a large drop in potash imports, particularly in materials other than muriate.

Superphosphate Declines In July

Superphosphate production in July was somewhat less than in June. Usually there is a moderate rise in July, with the seasonal trend continuing upward through December. Compared with July of last year there was a decline of 30% in production, making the 7th consecutive month that output was well below the corresponding month of '37.

Lead Arsenate Off 1½c

The only price change of importance in the agricultural insecticides last month was a 1½c reduction in the price on lead arsenate, east of the Rockies. On the new basis carlots in bags to dealers are now 11c with a ½c differential for l.c.l. quantities.

Sets Fall Meeting Dates

The N.F.A. executive offices announce that the 14th Annual Southern Convention of the Association will be held Nov. 14-16 at the Atlanta-Biltmore, Atlanta, Ga.

Natural Raw Materials

Raw Materials Rise On War Scare

Tanning Materials, Natural Varnish Gums Advanced When War-Risk Insurance Rates Soar—Candelilla and Japan Waxes At Higher Levels—Corn Derivatives Stronger—African Beeswax Weakens—Shellac Quiet—Naval Stores Markets Mark Time—Turpentine at 20½c at Savannah—

Quite naturally the natural raw materials reacted first to the European war scare of the past month. This was particularly true of those items largely imported from Europe or from parts of the world belonging to the European powers directly mixed up in the Czech-Reich crisis. Most of the price advances were forced by the almost prohibitive war-risk insurance rates which were placed in effect when the situation became highly acute. Some buying was reported at the sharply higher price levels announced for several of the more important tanning materials, but in the main actual sales were few and far between. However, some buyers were caught short on inventories and were forced to cover at least part of their future requirements for the next 3 months.

Almost the identical situation prevailed in the natural varnish gums. Purchasing had been extremely light over the last few months and buyers were playing a waiting game as long as prices continue to soften, hoping, of course, to call the turn just at the right moment. Faced with low inventories and a fear that spot stocks in importers' hands were insufficient for more than a few weeks, buyers had little choice but to come into the market when it appeared that nothing could stop a war in Europe. The net result was higher quotations for several of the gums and a firmer tone in all of them. Whether this condition will continue is largely a question of to what degree business generally improves over the next 60 days.

Japan Wax Advanced

In the waxes higher prices were named for Japan and Candelilla. Stocks of Candelilla in the hands of dealers are said to be low. Replacement costs were responsible for the firmer tone. A somewhat similar set of conditions prevailed in the market for Japan wax. Recent cables from the primary source indicate that replacements will be at a price quite a little above the prices of a few months ago. African beeswax was unsettled last month and prices dropped a ½c to basis of 20½c in 10-bag lots. Carnauba prices were steady and unchanged during the period under review. Trading was light.

Corn Derivatives Slightly Higher

Included in the price changes of the month were:—A 5c advance in all of the corn derivatives; a 4c increase in egg yolk; a 2c decline in egg albumen; and a 1c decline in spermaceti. Shellac prices held fairly steady with little improvement in the volume of actual business placed.

Turpentine Slumps to 20½c

The naval stores markets generally marked time during the European crisis last month. Pricewise the markets in the primary centers were mixed affairs—some grades of rosin registering sharp advances while others lost some ground. Turpentine sank to a lower level, a loss of 1¾c being recorded in the 30-day period. It is necessary to go back many years to find turpentine selling at 20½c in Savannah.

Buyers of naval stores are restricting commitments pretty largely to immediate needs only. The uncertainty over the foreign situation, the desire to know more definitely about the outcome of the Washington conference on next year's conservation program, and the lack of specific information about the future financing plans of the government are a few of the factors that are tending to slow up the movement of naval stores into consumers' hands. The net price changes for the past month at Savannah are given below:—

	Sept. 30	Aug. 31	Net Gain or Loss
B	$3.50	$3.50	
D	3.80	3.85	—$0.05
E	3.90	4.10	— 0.20
F	4.95	4.10	+ 0.85
G	4.95	4.10	+ 0.85
H	4.95	4.10	+ 0.85
I	4.95	4.10	+ 0.85
K	4.95	4.10	+ 0.85
M	4.95	4.15	+ 0.80
N	5.45	5.00	+ 0.45
WG	5.60	5.20	+ 0.40
WW	6.10	6.15	— 0.05
X	6.10	6.15	— 0.05
Turpentine	20½c	22¼c	— 1¾c

U. S. Gypsum's New Plant

Plans for the erection of a new and completely modern plant near Jacksonville, Fla., to aid in servicing the growing southern building market were announced recently by the U. S. Gypsum Co.

Brautlecht In New Role

Dr. Charles A. Brautlecht, professor of chemistry and chemical engineering and collaborator in the Agricultural and Engineering Experiment Stations at the University of Maine, is a consultant for the newly formed Aroostook Potato Products, Inc. This new company is now erecting a modern factory in Houlton, Maine, which is to be equipped with the most modern machinery for the manufacture under chemical control of the highest quality white potato starch. This company also plans eventually to make other products from potatoes.

Important Price Changes

	Sept. 30	Aug. 31
ADVANCED		
Corn sugar	$ 3.05	$ 3.00
Corn syrup 42°	2.99	2.94
43°	3.04	2.99
Copra	.0195	.0185
Dextrin, corn	3.40	3.35
British Gum	3.65	3.60
Egg yolk	.66	.62
Gum Arabic powd.	.12½	.12
Gum Dammar Singapore No. 2	.10¾	.10⅜
Mangrove bark	26.00	24.50
Starch, Pearl	2.50	2.45
powdered	2.60	2.55
Sumac, grd.	68.00	67.00
Valonia beards	48.00	45.00
cups	32.00	30.00
Wax Candelilla	.15	.14½
Wax Japan	.10¾	.10
Zinc dust	.0695	.06¾
DECLINED		
Albumen, egg	$ 0.78	$ 0.80
Gum East India Macassar nubs.	.09⅛	.10
Gum Copal Manila Dust	.05⅛	.05⅜
Gum Dammar Batavia C	.15¾	.16⅝
Shellac, Garnet	.12½	.13½
Wattle bark	39.00	39.75
Wax Bees, yellow	.20½	.21
Wax Spermaceti, blocks	.22	.23
cakes	.23	.24

New Plants Projected

Ware & McKee, Dewey, S. D., is operating a new bentonite mill . . . Champion Paper & Fibre, Hamilton, Ohio, will construct a new clay-washing and refining plant at Sandersville, Ga. . . Louisiana Boganite Corp., Bogalusa, La., will erect a new clay plant shortly.

New Tung Oil Plant

A new tung nut crushing plant, 6th of its kind in the U. S., is under construction at Citronelle, Ala., and will be ready the middle of October, the Mobile Chamber of Commerce has announced.

The mill is being built by the Citronelle Ice Co., and P. M. Childress, manager, said he expected 600 tons of nuts, raised in Mobile County and in neighboring George, Greene and Jackson counties, Mississippi, will be crushed in the plant during the initial season.

Buys Waldo Assets

Mineral Pigments Corp., Muirkirk, Md., has taken over the entire assets and good-will of E. M. & F. Waldo, Inc., and is continuing its operations under the same technical and manufacturing personnel.

" THEY SAY A CARPENTER IS KNOWN BY HIS CHIPS "

STARKIE BINDER A Pure Synthetic Pitch • ASPHALT • GILSONITE • VEGETABLE OILS • VEGETABLE AND ANIMAL FATTY ACIDS • NAPHTHENIC ACIDS • STEARIC ACID • ASBESTOS FIBRES • CAROB FLOUR • BENTONITE • DIATOMACEOUS EARTH

And Starkie is known for its non-toxic synthetic pitch made from a pure vegetable base.

Starkie Synthetic Pitches, though containing no waxes, are far less sticky than other pitches of the same consistency; they oxidize very much slower than ordinary fatty acid pitches; their coking properties are extremely uniform; their fluidity at saturating temperatures is excellent and flexibility is uniform.

If you manufacture any of the following, you can use Starkie Pitch to great advantage: Asphalt Floor Tile, Various Bituminous Products, Insulating Impregnating Compounds, Paints, Paper, Insulation Materials, Textile Products and Roofing.

Write for detailed information on the use of Starkie Pitch in your process.

STARKIE WEATHERPROOF AND CODE WIRE FINISHES

"Tailor Made To Your Requirements"

A. E. STARKIE CO.

1645 S. KILBOURN AVE. CHICAGO, ILLINOIS

Price Declines Feature Fats and Oils Markets

Chinawood Drops to a New Low When Demand Fails to Improve—Crude Coconut Firmer—Sudden Spurt In Linseed Oil Buying Sends Prices Up—Refined Fish Oils Weaken Further—Ample Stocks of Chinawood at Hankow and Hong Kong—

Fats and Oils

For the second consecutive month the general price trend of the fats and oils has been downward. A slight upward movement appeared when the threat of a conflict in Europe suddenly developed and buyers hastened to cover at least a portion of their future requirements, but this was of comparatively short duration and was followed by another period of lethargy. Buyers momentarily are showing very little interest in futures and are again adopting a waiting plan.

Despite an improved outlook in the coatings field Chinawood prices slumped again last month. Local markets have been extremely quiet for several weeks. Offerings from abroad have been light. The softness in the market has developed principally because some sellers are willing to make concessions to move material out of storage.

Crude coconut was one of the few items that moved into a higher price range in the last few weeks. Copra was slightly higher. Reports in the trade had it that the soap manufacturers had manifested more than passing interest and these rumors were sufficient to lend strength to a very thin market. No change was reported in the refined oil.

In contrast with most of the other paint oils linseed quotations firmed up quite appreciably, the first showing of real strength in some time. Crushers were quoting 8.3c in tankcars near the end of September based on higher flaxseed prices both abroad and here. A reactionary movement set in at the turn of the month when the heavy linseed oil buying wave slowed up and some shading from published schedules was reported.

In sympathy with the decline in Chinawood most of the other important paint oils lost ground in light trading and despite, in most cases, light offerings. There is little gainsaying the fact that so far the purchases of drying oils for the fall season have been quite disappointing to most factors. Oiticica and perilla lost ground with buyers evincing little interest.

Fish Oils Go Lower

The sharp declines in the refined fish oils of the past few months carried over into September. Stocks are said to be large and the demand disappointing, with the result that severe competition exists for the restricted volume available. In comparison with the vegetable and fish oils the animal fats and greases presented a fairly stable price front.

Chinawood Stocks Ample

Despite disturbed conditions in and about Hankow, China, the Yangtze River port through which 90% of the world's tung oil normally passes, shipments to world markets during recent months have continued in quantities sufficient for world requirements, according to C. C. Concannon, Chief of the Commerce Dept.'s Chemical Division.

Reexports of oil from Hong Kong during July aggregated 12,367,600 lbs., 9,646,800 lbs. going directly to the U. S. and the remainder to Europe. This, Mr. Concannon points out, is well above normal for this season, and compares with an average of 8,633,800 lbs. per month during the first half of the year.

Notwithstanding substantial clearances of tung oil from Hankow in August, estimated at about 8,800,000 lbs., stocks on hand in that center on Aug. 31, reported at 22,000,000 lbs., were the highest in recent years, according to *Tung Oil Monthly*.

In addition to the tung oil leaving Hankow, it is reported that between 10,000,000 and 12,000,000 lbs. were shipped from Changsha to Hong Kong by truck and rail during July and August.

Dunning In New Field

Stanley G. Dunning has been appointed sales manager for the New England Whiting Co., East Boston, Mass., and vice-president in charge of sales for the West Coast Kalsomine Co. of Louisiana, according to John G. Penniman, executive vice-president of the West Coast Kalsomine Co. His headquarters will be in N. Y. City.

Mr. Dunning resigned recently as general sales manager for the Muralo Co. He has long been prominent in paint association affairs and is vice-president of the N. Y. Paint, Varnish & Lacquer Association.

Story of Aluminum

The story of the invention by a college boy in a woodshed laboratory of the electrolytic furnace process for making aluminum is told in the October issue of *Priorities*, house organ of Prior Chemical, N. Y. City. Following this achievement in 1886 the story traces the further development of this useful element to its present high place among commercial metals, only 4 of which outrank it in volume used. Also mentioned are the innumerable and widely diversified uses which are being made of aluminum due to its special qualities and versatility.

Important Price Changes

	Sept. 30	Aug. 31
ADVANCED		
Oil Coconut, Manila, tks. N. Y.	$0.03⅜	$0.03¼
tks. Pac. Coast	.03	.02⅞
Oil Linseed, raw, tks.	.083	.07½
bbls., c. l.	.089	.081
DECLINED		
Oil Chinawood, drs.	$0.12½	$0.13½
tks.	.118	.128
Oil Corn ref'd	.09¾	.10¼
crude, tks.	.07	.08
Oil Menhaden, ref'd alk., drs.	.067	.07¼
tks.	.061	.069
kettle-bodied, drs.	.076	.084
light-pressed, drs.	.061	.069
tks.	.05½	.063
Oil Oiticica	.10½	.10¾
Oil Oleo No. 1	.09½	.09¾
Oil Oleo No. 2	.09¼	.09
Olive Oil Foots	.07	.07⅝
Oil Peanut, crude, tks.	.07⅛	.07¼
Oil Perilla, drs.	.09¾	.10½
tks.	.09	.098
Oil Sardine, crude	.28	.23½
ref'd alkali, drs.	.067	.07½
tks.	.061	.069
light-pressed, drs.	.061	.069
tks.	.05½	.063

Air Hygiene Meeting

The annual meeting of the Air Hygiene Foundation will be held at Mellon Institute, Pittsburgh, on Nov. 17. Foundation is a non-profit science organization for the advancement of industrial health. A broad and interesting program of papers has been arranged.

Two new engineering bulletins have recently been issued to the 250 member companies. They are:—"Determination of Lead in Air," and "Identification of Industrial Dusts."

Bulletin on Boiler Treatment

A complete departure from common methods of removing and preventing boiler scale and rust is described in a new bulletin on the Corrosan Process, just published by Ferrotect Industries, 723 Varsity rd., South Orange, N. J.

In direct contrast with common methods which require constant testing and treating the entire feed water supply, Corrosan is applied only periodically and without regard to the nature of the feed water. Corrosan is entirely self-applying, and is said to remove and prevent scale and rust even in the most inaccessible parts of the boiler without a shutdown.

Pigments and Fillers

Lead Oxides Advanced Sharply

Casein Prices Weaken When Argentine Material Is Offered—Ester Gum Declines ½c to 6¼c—Scarlet Ink Toner Up 5c—Contract Prices For Chemical Colors and Earth Pigments Renewed For 4th Quarter—Natural Gums Strengthen—Paramet Chemical Announces List of Representatives—U. S. I. Acquires Stroock & Wittenberg—Golden Jubilee Meeting To Be Held at Atlantic City—

Important Price Changes

	Sept. 30	Aug. 31
ADVANCED		
Lead metal, N. Y.	$5.10	$4.95
Lead Red 95%	.076	.074
97%	.0785	.0765
98%	.081	.079
Litharge	.066	.064
Orange mineral	.10½	.10¼
Zinc metal, N. Y.	5.35	5.15
E. St. Louis	4.95	4.75
DECLINED		
Cadmium sulfide, orange	$0.85	$0.90
Casein, 20-30 mesh	.08¾	.10
80-100 mesh	.09¼	.10½
Gum Ester	.06¼	.06¾
Red vermilion, mercury	1.45	1.55

Paramet's Representatives

As previously announced, Paramet Chemical Corp. terminated the sales agency of Stroock & Wittenberg Corp. on Sept. 24. For the past 11 years Stroock & Wittenberg Corp. has marketed in the U. S. the synthetic resins manufactured exclusively by Paramet Chemical, but as of Sept. 26, Paramet's products will be marketed by direct regional representatives. The only change effected by this move is that Paramet's customers will be serviced by direct representatives of the manufacturer, instead of by subagents of a selling organization. Other than this, there are no changes whatsoever, either in the method and supervision of manufacture, in the technical personnel which has developed all of Paramet's products, or in the products themselves.

Paramet reports its regional sales representatives and their territories are as follows: Calo & Lydon, 90 West st., N. Y. City, territory: Metropolitan N. Y. and adjacent portions of New Jersey and Connecticut; Mulcahy & Griffin, 141 Milk st., Boston, Mass., territory: New England; George A. Rowley Co., 937 N. Front st., Philadelphia, Pa., territory: Philadelphia and adjacent territory; L. B. Griffith Co., Inc., P. O. Box 976, New Orleans, La., territory: Louisiana, Mississippi, Alabama, and Pensacola, Florida.

Also Edward R. Dornoff, 4036 W. Lake st., Chicago, Ill., territory: Chicago and vicinity, and adjacent portions of Michigan and Wisconsin; O. J. Friend & Co., 815 National Bldg., Minneapolis, Minn., territory: Minneapolis and vicinity.

Also Henry F. Brooks, 626 University Bldg., Denver, Colorado, territory: Colorado; Marshall Dill, 2465 Porter st., Los Angeles, Calif., and 30 Bluxome st., San Francisco, Calif., territory: Pacific Coast.

Two price rises in the lead oxides were easily the feature news of the pigments last month. With the metal advancing, producers of the oxides placed in effect the following schedule on lead oxide:—95% at 7.60c-7.85c; 97% at 7.85c-8.10c; 98% at 8.10c-8.35c. The "card" prices were advanced ¼c. Higher prices were also announced for litharge and orange-mineral. The 4th quarter prices for white lead were announced Sept. 15th and showed no change from the levels established in mid-July. Advances were made late in the month in white lead-in-oil and red lead-in-oil. There is considerable sentiment in the trade that further increases are likely to occur in the near future.

Casein prices weakened and at the month-end 20-30 mesh material was quoted at 8¾c and 80-100 mesh at 9¼c. The reason for the decline was said to be the offering of Argentine material at 9½c and 10c per lb., duty paid. Other reductions of the month included a 5c advance in scarlet ink toner, a ½c reduction in ester gum, and a reduction of from 1c to 5c in aluminum powder and paste. The new basic price for ester gum in the East is now 6¼c.

4th Quarter Prices Unchanged

Contract prices for practically all of the chemical colors and also earth colors were unchanged at the beginning of the last quarter. Producers of stearates and palmitates booked 3-month contracts for the final quarter at unchanged price levels.

In practically all instances importers added the high freight insurance costs to their prices when quoting for direct shipment. There was a decidedly uneasy feeling in the trade concerning those raw paint materials which are largely imported from abroad, and it was with a great deal of relief that the news was received that the 4-Power Agreement had been reached at Munich only a few hours before the Reich Army was scheduled to move on the Sudeten territory. It is now hoped that an early solution of the Spanish War will also follow.

The fear of war abroad did halt the continued downward trend in the natural varnish gums. As soon as the situation abroad appeared dangerous, replacement prices stiffened immediately and several important price increases were made. Whether the firmer tone will hold largely depends upon the developments in the coatings field over the next few weeks. The heavy damages sustained along the Eastern seaboard have created a large back-log of business, but it is felt that much of this business will not reach the paint manufacturer until next spring. Building construction, however, is encouraging and the fall paint season is expected to compare quite favorably with last year's total.

August paint, varnish, lacquer, and filler sales by 680 establishments, as reported by the Bureau of the Census, totalled $30,182,013, as compared with $35,305,043 in the same month of '37. Total sales for the first 8 months amount to $239,093,812, as compared with $306,-368,212 in the corresponding period of last year.

Brighter Outlook in Detroit

Producers of coatings for the automotive field are still disappointed in the sales to that field. September output is estimated around 100,000 units. Ten automotive producers were in production on Sept. 24 on '39 cars. Some of the producers have not been able to get under way as quickly as had been hoped. However, the delay is a temporary one and from all parts of the country come reports of an acute shortage of cars which means that assembly lines will be rushed during October.

Expands Further In Resins

The U. S. Industrial Alcohol Co., which recently entered the synthetic resin industry through the acquisition of the business of Robert Rauh, Inc., announces a further expansion in that field by the purchase of Stroock & Wittenberg Corp. All the business of the two purchased companies, in both natural and synthetic resins, will be handled by the Stroock & Wittenberg Corp. from its office at 17 Battery pl., N. Y. City, under the personal direction of Mr. A. J. Wittenberg, its president.

Golden Jubilee Meeting

With the ending of the holiday season, the industry's thoughts are turning to the Golden Jubilee Convention of the National Paint, Varnish & Lacquer Association, to be held at the Ambassador Hotel, Atlantic City, Oct. 26, 27, 28.

SAVE MONEY BY USING

"SODACET"

(Trade Mark)

Sodium Acetate Special 90%

NIACET

CHEMICALS CORPORATION

Sales Office and Plant ✣ Niagara Falls, N. Y.

Pound for pound, "SODACET" contains 50% MORE actual Sodium Acetate than the commercial grade.

Write for sample and further information

OXYGEN AND HYDROGEN PLANTS

Production Units Will Be Installed Adjacent to Plants of Large Users

★ ★ ★

Some of Our Products—

Oxygen
Acetylene
Hydrogen
Ethylene
Nitrous Oxid
Cyclopropane
Helium
Carbon Dioxid
Liquid Oxygen
Carbon Dioxid-Oxygen Mixtures

Acetylene Generators
"Hobart" Electric Welders
Carbide—Soda Lime
Welding Rods, Gas and Electric
Welding and Cutting Torches
Safety Pressure Regulators
Gas Lighters
Goggles and Helmets—Hose
Lead-Burning Equipment
Anesthesia Equipment
Oxygen Tents (for Sale or Rental)
Resuscitation Apparatus

By Invitation Member

Emblem of BUSINESS CHARACTER
Rice Leaders of the World Association
Represents High Standing in NAME-PRODUCT-POLICY

PURITAN COMPRESSED GAS CORPORATION

Pioneer Gas Manufacturers

General Offices
Kansas City, Mo.

Branches in
Several Principal Cities

Prices Current

Heavy Chemicals, Coal-tar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Petroleum Solvents and Chemicals, Naval Stores, Fats and Oils, etc.

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Import chemicals are so designated. Resale stocks when a market factor are quoted in addition to maker's prices and indicated "second hands."

Oils are quoted spot New York, ex-dock. Quotations f. o. b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f. o. b., or ex-dock. Materials sold f. o. b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1937 Average $1.10 - Jan. 1938 $1.20 - Sept. 1938 $1.24

		Current Market	1938 Low	1938 High	1937 Low	1937 High
Acetaldehyde, drs, c-l, wks	lb.	...	.14	...	.14	...	.14
Acetaldol, 95%, 50 gal drs wks	lb.	.21	.25	.21	.25	.21	.25
Acetamide, tech, lcl, kegs	lb.	.39	.43	.32	.43	.32	.43
Acetanalid, tech, 150 lb bbls	lb.	...	.29	.29	.32	.24	.29
Acetic Anhydride, drs, f.o.b. wks, frt all'd	lb.	.10½	.11	.10½	.11	.13	.15
Acetin, tech, drs	lb.	...	.33	...	.33	.22	.33
Acetone, tks, f.o.b. wks, frt all'd	lb.	...	.04¾	...	.04¾	.04¾	.06½
drs, c-l, f.o.b. wks, frt all'd	lb.	...	.05¾	...	.05¾	.05¾	.07½
Acetyl chloride, 100 lb cbys	lb.	.55	.68	.55	.68	.55	.68
ACIDS							
Abietic, kgs, bbls	lb.	.08¾	.09	.08¾	.10	.06¾	.10
Acetic, 28%, 400 lb bbls, c-l, wks 100 lbs.		...	2.23	...	2.23	2.23	2.53
glacial, bbls, c-l, wks 100 lbs.		...	7.62	...	7.62	7.62	8.70
glacial, USP, bbls, c-l, wks 100 lbs.		...	10.25	...	10.25	10.50	12.43
Acetylsalicylic, USP, 225 lb bbls	lb.	...	.60	...	.60	.50	.60
Adipic, kgs, bbls	lb.	...	.72	...	.72	.	.72
Anthranilic, ref'd, bbls	lb.	1.15	1.20	1.15	1.20	.85	1.00
tech, bbls	lb.		.75	...	.75	...	.75
Ascorbic, bot.	oz.	3.00	3.25	...	...	...	...
Battery, cbys, wks	100 lbs.	1.60	2.55	1.60	2.55	1.35	2.60
Benzoic, tech, 100 lb kgs	lb.	.43	.47	.43	.47	.43	.47
USP, 100 lb kgs	lb.	.54	.59	.54	.59	.54	.59
Boric, tech, gran, 80 tons, bgs, delv	ton *a*	...	96.00	95.00	96.00	...	95.00
Broenner's, bbls	lb.	...	1.11	...	1.11	...	1.11
Butyric, edible, c-l, wks, cbys	lb.	1.20	1.30	1.20	1.30	1.20	1.30
synthetic, c-l, drs, wks	lb.	...	.22	...	.22	...	.22
wks, lcl	lb.	...	.23	...	.23	...	.23
tks, wks	lb.	...	.21		.21	...	.21
Camphoric, drs	lb.	5.50	5.70	5.50	5.70	5.50	5.70
Chicago, bbls	lb.		2.10	...	2.10	...	2.10
Chlorosulfonic, 1500 lb drs, wks	lb.	.03½	.05	.03½	.05	.03½	.05
Chromic, 99¾%, drs, delv	lb.	.15¼	.17¼	.15¼	.17¼	.15¼	.16¼
Citric, USP, crys, 230 lb bbls	lb. *b*	.22	.23½	.22	.25	.24	.26
anhyd, gran, bbls	lb. *b*	..	.25½	.25½	.26½	.26½	.29
Cleve's, 250 lb bbls	lb.	...	.57	.50	.57	.50	.52
Cresylic, 99%, straw, HB, drs, wks, frt equal	gal.	.73	.74	.73	.91	.72	.91
99%, straw, LB, drs, wks, frt equal	gal.	.78	.86	.78	.94	.77	.94
resin grade, drs, wks, frt equal	lb.	.09¼	.09¾	.09¼	.11¼	.09	.11¼
Crotonic, bbls, delv	lb.	.21	.50	.21	1.00	.75	1.00
Formic, tech, 140 lb drs	lb.	.10½	.11½	.10½	.11½	.10½	.13
Fumaric, bbls	lb.	...	.75	.60	.75	...	.60
Fuming, see Sulfuric (Oleum)							
Gallic, tech, bbls	lb.	.70	.73	.70	.79	.65	.75
USP, bbls	lb.	.77	.81	.77	.91	.77	.91
Gamma, 225 lb bbls, wks	lb.	...	.85	...	.85	...	.85
H, 225 lb bbls, wks	lb.	.50	.55	.50	.55	.50	.55
Hydriodic, USP, 47% bottles	lb.	...	2.30	2.20	2.30	...	...
Hydrobromic, 34% conct 155 lb cbys, wks	lb.	.42	.44	.42	.44	.40	.42
Hydrochloric, see muriatic							
Hydrocyanic, cyl, wks	lb.	.80	1.30	.80	1.30	.80	1.30
Hydrofluoric, 30%, 400 lb bbls, wks	lb.	.07	.07½	.07	.07½	.07	.07½
Hydrofluosilicic, 35%, 400 bbls, wks	lb.	.09	.09½	.09	.15	.10½	.15
Lactic, 22%, dark, 500 lb bbls	lb.	.02½	.02¼	.02½	.02¾	.02½	.02¾
22%, light ref'd, bbls	lb.	.03½	.03¾	.03½	.03¾	.03½	.03¾
44%, light, 500 lb bbls	lb.	.05½	.05¾	.05½	.05¾	.05½	.05¾
44%, dark, 500 lb bbls	lb.	.06½	.06¾	.06½	.06¾	.06½	.06¾
50%, water white, 500 lb bbls	lb.	.10½	.11½	.10½	.11½	.10½	.11½
USP X, 85%, cbys	lb	.42	.45	.42	.45	.42	.50
Lauric, drs	lb.	11¾	.12¼	.08½	.12¼	...	...
Laurent's, 250 lb bbls	lb.	.45	.46	.45	.46	.45	.46
Levulinic, 5 lb bot, wks	lb.	...	2.00	...	2.00		
Linoleic, bbls	lb.		.20	...	.20	.16	.20
Maleic, powd, kgs	lb.	.30	.40	.30	.40	.29	.40
Malic, powd, kgs	lb.	.45	.60	.45	.60	.45	.60
Metanillic, 250 lb bbls	lb.	.60	.65	.60	.65	.60	.65
Mixed, tks, wks	N unit	.06½	.07¼	.06½	.07¼	.06½	.07¼
	S unit	.008	.009	.008	.009	.008	.009
Monochloracetic, tech, bbls	lb.	.16	.18	.16	.18	.16	.18
Monosulfonic, bbls	lb.	1.50	1.60	1.50	1.60	1.50	1.60
Muriatic, 18°, 120 lb cbys, c-l, wks 100 lb.		...	1.50	...	1.50	1.35	1.50
tks, wks 100 lb.		...	1.00	...	1.00	...	1.00
20°, cbys, c-l, wks 100 lb.		...	1.75	...	1.75	1.45	1.75
tks, wks 100 lb.		...	1.10	...	1.10	...	1.10
22°, c-l, cbys, wks 100 lb.		...	2.25	...	2.25	1.95	2.25
tks, wks 100 lb.		...	1.60	...	1.60	...	1.60
CP, cbys	lb.	.06½	.07⅛	.06½	.07⅛	.06½	.07⅛
N & W, 250 lb bbls	lb.	.85	.87	.85	.87	.85	.87
Naphthenic, 240-280 s.v., drs	lb.	.10	.13	.10	.13	.10	.14
Sludges, drs	lb.	...	.05	...	.05	.05	.10
Naphthionic, tech, 250 lb bbls	lb.	.60	.65	.60	.65	.60	.65
Nitric, 36°, 135 lb cbys, c-l, wks 100 lb.	*c*	...	5.00	...	5.00	...	5.00
38°, c-l, cbys, wks 100 lb.	*c*	...	5.50	...	5.50	...	5.50
40°, cbys, c-l, wks 100 lb.	*c*	...	6.00	...	6.00	...	6.00
42°, c-l, cbys, wks 100 lb.	*c*	...	6.50	...	6.50	...	6.50
CP, cbys, delv	lb.	.11½	.12½	.11½	.12½	.11½	.12½
Oxalic, 300 lb bbls, wks, or N Y	lb.	.10¾	.12	.10¾	.12	.10¾	.12
Phosphoric, 85%, USP, cbys	lb.	.12	.14	.12	.14	.12	.14
50%, acid, c-l, drs, wks	lb.	.06	.08	.06	.08	.06	.08
75%, acid, c-l, drs, wks	lb.	.09	.10½	.09	.10½	.09	.10½
Picramic, 300 lb bbls, wks	lb.	.65	.70	.65	.70	.65	.70
Picric, kgs, wks	lb.	.35	.40	.35	.40	.35	.40
Propionic, 98% wks, drs	lb.	...	.22	...	.22	.20	.22
80%	lb.	.16	.17½	.16	.17½	.16	.17½
Pyrogallic, tech, lump, pwd, bbls	lb.	...	1.05	...	1.05	...	...
cryst, USP	lb.	1.45	1.63	1.45	1.63	1.30	1.48
Ricinoleic, bbls	lb.	...	.35	.35	.38	.35	.38
tech, bbls	lb.	...	.13	...	.13	...	...
Salicylic, tech, 125 lb bbls, wks	lb.	...	.33	...	.33	...	.33
USP, bbls	lb.	.40	.45	.40	.45	...	...
Sebacic, tech, drs, wks	lb.	...	nom.	.37	.41	.37	.41
Succinic, bbls	lb.	...	.75	...	.75	...	.75
Sulfanilic, 250 lb bbls, wks	lb.	.17	.18	.17	.18	.17	.18
Sulfuric, 60°, tks, wks	ton	...	13.00	...	13.00	12.00	13.00
c-l, cbys, wks 100 lb.		...	1.25	...	1.25	1.10	1.25
66°, tks, wks	ton	...	16.50	...	16.50	15.50	16.50
c-l, cbys, wks 100 lb.		...	1.50	...	1.50	1.35	1.50
CP, cbys, wks	lb.	.06½	.07½	.06½	.07½	.06½	.07½
Fuming (Oleum) 20% tks, wks	ton	...	18.50	...	18.50	...	18.50
Tannic, tech, 300 lb bbls	lb.	.40	.47	.40	.47	.19	.47
Tartaric, USP, gran, powd, 300 lb bbls	lb.	.27¼	.27¾	.24¼	.27¾	.21¾	.25¼
Tobias, 250 lb bbls	lb.	.65	.67	.65	.67	.65	.67
Trichloroacetic bottles	lb.	2.00	2.50	2.00	2.50	2.00	2.50
kgs	lb.	...	1.75	.	1.75	...	1.75
Tungstic, tech, bbls	lb.	1.65	1.75	1.65	2.00	...	...
Vanadic, drs, wks	lb.	1.10	1.20	1.10	1.20	1.10	1.20
Albumen, light flake, 225 lb bbls	lb.	.52	.60	.52	.60	.47	.60
dark, bbls	lb.	.13	.18	.11	.18	.11	.17
egg, edible	lb.	.78	.80	.78	1.15	.76	1.15
vegetable, edible	lb.	.74	.78	.74	.78	.76	.78
Alcohol, Amyl (from Pentane) tks, delv	lb.	...	.106	.106	.123	...	.123
c-l, drs, delv	lb.	...	.116	.116	.133	...	.133
lcl, drs, delv	lb.	...	.126	.126	.143	...	.143
Amyl, secondary, tks, delv	lb.	...	.08½	...	.08½	...	.08½
drs, c-l, delv E. of Rockies	lb.	...	.09½	...	.09½	...	...
Benzyl, cans	lb.	.68	1.00	.68	1.00	.65	1.10
Butyl, normal, tks, f.o.b. wks, frt all'd	lb. *d*	...	.08½	.08½	.09	.08½	.09
c-l, drs, f.o.b. wks, frt all'd	lb. *d*	...	.09½	.09½	.10	.09½	.10
Butyl, secondary, tks, delv	lb. *d*	...	.06	...	.06	.06	.07
c-l, drs, delv	lb. *d*	...	.07	...	.07	.07	.08
Capryl, drs, tech, wks	lb.	...	.85	.	.85	...	.85
Cinnamic, bottles	lb.	2.00	2.50	2.00	2.50	2.00	3.65
Denatured, CD, 14, 13, c-l, drs, wks	gal. *e*	...	.31	.31	.35	.33	.35
tks, East, wks	gal.	...	.23	.23	.29	...	...
Western schedule, c-l, drs, wks	gal. *e*	...	.36	.36	.38	.37	.39
Denatured, SD, No. 1, tks		...	.23	.23	.27	.26	.27
c-l, drs, wks	gal. *e*	...	.29	.29	.33	.32	.33

a Powdered boric acid $5 a ton higher in each case; USP $15 higher; *b* Powdered citric is ½c higher; kegs are in each case ½c higher than bbls.; *y* Price given is per gal.

c Yellow grades 25c per 100 lbs. less in each case; *d* Spot prices are 1c higher; *e* Anhydrous is 5c higher in each case; *f* Pure prices are 1c higher in each case.

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; refined, ref'd; tanks, tks; works, f.o.b., wks.

		Current Market	1938 Low	1938 High	1937 Low	1937 High
Alcohols (continued):						
Diacetone, pure, c-l, drs, delv	lb. *f*	.11½		.11½		.11½
tech, contract, drs, c-l, delv	lb.	.10½		.10½		
Ethyl, 190 proof, molasses, tks	gal. *g*	4.49½	4.04	4.51½	4.05	4.07
c-l, drs	gal. *g*	4.55½	4.10	4.59½	4.11	4.12
c-l, bbls	gal. *g*	4.56½	4.11	4.58½	4.12	4.13
absolute, drs., f.o.b. wks.	*g* 4.88	4.95	4.40	4.93	4.54	6.08½
Furfuryl, tech, 500 lb drs	lb. .25	.35	.25	.35	.30	.35
Hexyl, secondary tks, delv	lb.	.12		.12	.11½	.12
c-l, drs, delv	lb.	.13		.13	.12½	.13
Normal, drs, wks	lb. 3.25	3.50	3.25	3.50	3.25	3.50
Isoamyl, prim, cans, wks	lb.	.32		.32		.32
drs, lcl, delv	lb.	.27		.27		.27
Isobutyl, ref'd, lcl, drs	lb.	.09	.09	.10		.10
c-l, drs	lb.	.08½	.08½	.09½		.09½
tks	lb.	.07½	.07½	.08½		.08½
Isopropyl, ref'd, 91%, c-l, drs, f.o.b. wks, frt all'd	lb.	.36		.36	.39½	.45
Ref'd 98%, drs. f.o.b. wks, frt all'd	gal.	.41		.41		
Tech 91%, drs, above terms	gal.	.33½		.33½		
tks, same terms	gal.	.28½		.28½		
Tech 98%, drs, above terms	gal.	.37½		.37½		
tks, above terms	gal.	.32½		.32½		
Spec Solvent, tks, wks	gal.	.24	.24	.28	.27	.28
Aldehyde ammonia, 100 gal drs	lb. .80	.82	.80	.82	.80	.82
Aldehyde Bisulfite, bbls, delv	lb.	.17		.17		
Aldol, 95%, 55 and 110 gal drs, delv	lb.	.20		.20		
Alphanaphthol, crude, 300 lb bbls	lb.	.52		.52		.52
Alphanaphthylamine, 350 lb bbls	lb. .32	.34	.32	.34	.32	.34
Alum, ammonia, lump, c-l, bbls, wks	100 lb. 3.40	3.65	3.40	3.65	3.00	3.25
delv NY, Phila	100 lb.	3.40		3.40	3.15	3.40
Granular, c-l, bbls, wks	100 lb. 3.15	3.40	3.15	3.40	2.75	3.00
Powd, c-l, bbls, wks	100 lb.	3.55		3.55	3.15	3.40
Chrome, bbls	100 lb. 6.50	6.75	6.50	6.75	6.50	7.25
Potash, lump, c-l, bbls, wks	100 lb. 3.65	3.90	3.65	3.90	3.25	3.50
Granular, c-l, bbls, wks	100 lb. 3.40	3.65	3.40	3.65	3.00	3.25
Powd, c-l, bbls, wks	100 lb. 3.80	4.05	3.80	4.05	3.40	3.65
Soda, bbls, wks	100 lb.	3.25		3.25		3.25
Aluminum metal, c-l, NY	100 lb.	20.00		20.00	19.00	20.00
Acetate, 20%, bbls	lb. .07½	.09	.07½	.10	.09	.10
Basic powd, bbls, delv	lb. .40	.50	.40	.50		
Chloride anhyd, 99%, wks	lb. .07	.12	.07	.12	.07	.12
93%, wks	lb. .05	.08	.05	.08	.05	.08
Crystals, c-l, drs, wks	lb. .06	.06¼	.06	.06¼	.06	.06¼
Solution, drs, wks	lb. .02¾	.03¼	.02¾	.03¼	.02¾	.03¼
Formate, 30% sol bbls, c-l, delv	lb.	.13		.13		
Hydrate, 96%, light, 90 lb bbls, delv	lb. .12	.13	.12	.13	.13	.15
heavy, bbls, wks	lb. .029	.03½	.029	.03½	.029	.03½
Oleate, drs	lb. .16¾	.18½	.16¾	.18½	.16¾	.18½
Palmitate, bbls	lb.	.23		.23	.22	.23
Resinate, pp., bbls	lb.	.15		.15		.15
Stearate, 100 lb bbls	lb. .19	.21	.19	.21	.19	.21
Sulfate, com, c-l, bgs, wks	100 lb.	1.15	1.15	1.35		1.35
c-l, bbls, wks	100 lb.	1.35	1.35	1.55		1.55
Sulfate, iron-free, c-l, bgs, wks	100 lb.	2.00		2.00		1.90
c-l, bbls, wks	100 lb.	2.20		2.20		2.05
Aminoazobenzene, 110 lb kgs	lb.	1.15		1.15		1.15
Ammonia anhyd fert com, tks	lb. .04½	.05½	.04½	.05½	.04½	.05½
Ammonia anhyd, 100 lb cyl	lb. .16	.22	.16	.22	.16	.22
26°, 800 lb drs, delv	lb. .02¼	.02½	.02¼	.02½	.02¼	.02½
Aqua 26°, tks, NH	cont.	.05		.05	.04½	.05
tk wagon	lb.	.02		.02		.02
Ammonium Acetate, kgs	lb. .26	.33	.26	.33	.26	.33
Bicarbonate, bbls, f.o.b. wks	100 lb. 5.15	5.71	5.15	5.71	5.15	5.71
Bifluoride, 300 lb bbls	lb. .14½	.16½	.14½	.17	.16	.17
carbonate, tech, 500 lb bbls	lb. .08	.12	.08	.12	.08	.12
Chloride, White, 100 lb bbls, wks	100 lb. 4.45	4.90	4.45	4.90	4.45	4.90
Gray, 250 lb bbls, wks	100 lb. 5.50	6.25	5.50	6.25	5.00	6.25
Lump, 500 lbs cks spot	lb. .10½	.11	.10½	.11	.10½	.11
Lactate, 500 lb bbls	lb. .15	.16	.15	.16	.15	.16
Laurate, bbls	lb.	.23		.23		
Linoleate, 80% anhyd, bbls	lb.	.15		.15	.11	.15
Naphthenate, bbls	lb.	.17		.17		
Nitrate, tech, cks	lb. .038	.0405	.038	.0405	.03¾	.04
Oleate, drs	lb.	.15		.15	.15	.10
Oxalate, neut, cryst, powd, bbls	lb. .19	.20	.19	.22½	.22½	.23
Perchlorate, kgs	lb.	.16		.16		.16
Persulfate, 112 lb kgs	lb. .21	.24	.21	.24	.21	.24
Phosphate, dibasic tech, powd, 325 lb bbls	lb. .07½	.10	.07½	.10	.07½	.10
Ricinoleate, bbls	lb.	.15		.15		
Stearate, anhyd, bbls	lb.	.24		.24		
Paste, bbls	lb.	.07½		.07½		

g Grain alcohol 20c a gal. higher in each case.

		Current Market	1938 Low	1938 High	1937 Low	1937 High
Ammonium (continued).						
Sulfate, dom, f.o.b., bulk	ton	27.25	26.50	28.50	26.00	28.00
Sulfocyanide, pure, kgs	lb.	.55		.55		.55
Amyl Acetate (from pentane) tks, delv	lb.	.10	.10	.11½		.11½
c-l, drs, delv	lb.	.11				
lcl, drs, delv	lb.	.12				
tech, drs, delv	lb.	.10½	.11	.10½	.11¼	.13½
Secondary, tks, delv	lb.	.08½		.08½		.08½
c-l, drs, delv	lb.	.09½		.09½		.09½
tks, delv	lb.	.08½		.08½		.08½
Chloride, norm, drs, wks	lb. .56	.68	.56	.68	.56	.68
mixed, drs, wks	lb. .07	.077	.07	.077	.07	.077
tks, wks	lb.	.06		.06		.06
Mercaptan, drs, wks	lb.	1.10		1.10		1.10
Oleate, lcl, wks, drs	lb.	.25		.25		.25
Stearate, lcl, wks, drs	lb.	.26		.26		.26
Amylene, drs, wks	lb. .102	.11	.102	.11	.102	.11
tks, wks	lb.	.09		.09		.09
Aniline Oil, 960 lb drs and tks	lb. .14½	.17½	.14½	.17½	.15	.17½
Annatto fine	lb. .34	.37	.34	.37	.34	.37
Anthracene, 80%	lb.	.75		.75		.75
40%	lb.	.18		.18		.18
Anthraquinone, sublimed, 125 lb bbls	lb.	.65		.65	.50	.65
Antimony metal slabs, ton lots	lb.	.11¾	.10¾	.14	.13⅝	.17¼
Butter of, see Chloride.						
Chloride, soln cbys	lb.	.17		.17		.17
Needle, powd, bbls	lb. .12½	.14	.12½	.16	.14	.19½
Oxide, 500 lb bbls	lb. .11½	.12½	.11½	.16½	.14¼	.16½
Salt, 63% to 65%, tins	lb. .26	.27	.26	.27	.22	.24
Sulfuret, golden, bbls	lb. .22	.23	.22	.23	.22	.23
Archil, conc, 600 lb bbls	lb. .21	.27	.21	.27	.21	.27
Double, 600 lb bbls	lb. .18	.20	.18	.20	.18	.20
Aroclors, wks	lb. .18	.30	.18	.30	.18	.30
Arrowroot, bbl	lb. .08½	.09	.08½	.09	.08½	.09¾
Arsenic, Metal	lb. .40	.41	.40	.44	.42	.44
Red, 224 lb cs kgs	lb.	.15¾		.15¾		.15¾
White, 112 lb kgs	lb. .03	.03¾	.03	.04	.03	.04
Barium Carbonate precip, 200 lb bgs, wks	ton 52.50	62.50	52.50	62.50	52.50	62.50
Nat (witherite) 90% gr, c-l, wks, bgs	ton 41.00	43.00	41.00	44.00	42.00	45.00
Chlorate, 112 lb kgs, NY	lb. .16½	.17½	.16½	.17½	.16½	.17½
Chloride, 600 lb bbls, delv, zone 1	ton 77.00	92.00	77.00	92.00	74.00	92.00
Dioxide, 88%, 690 lb drs	lb. .11	.12	.11	.12	.11	.12
Hydrate, 500 lb bbls	lb. .04¾	.05½	.04¾	.05½	.04¾	.05½
Nitrate, bbls	lb. .06¾	.07¼	.06¾	.08¼	.07	.08¼
Barytes, floated, 350 lb bbls c-l, wks	ton	23.65		23.65		23.65
Bauxite, bulk, mines	ton 7.00	10.00	7.00	10.00	7.00	10.00
Bentonite, c-l, 325 mesh, bgs, wks	ton	16.00		16.00		16.00
200 mesh	ton	11.00		11.00		11.00
Benzaldehyde, tech, 945 lb drs, wks	lb. .60	.62	.60	.62	.60	.62
Benzene (Benzol), 90%, Ind, 8000 gal tks, ft all'd	gal.	.16		.16		.16
90% c-l, drs	gal.	.21		.21		.21
Ind pure, tks, frt all'd	gal.	.16		.16		.16
Benzidine Base, dry, 250 lb bbls	lb. .70	.72	.70	.72	.70	.72
Benzoyl Chloride, 500 lb drs	lb. .40	.45	.40	.45	.40	.45
Benzyl Chloride, 95-97% rfd, drs	lb. .30	.40	.30	.40	.30	.40
Tech, drs	lb. .25	.26	.25	.26	.25	.26
Beta-Naphthol, 250 lb bbl, wks	lb. .23	.24	.23	.24	.23	.24
Naphthylamine, sublimed, 200 lb bbls	lb. 1.25	1.35	1.25	1.35	1.25	1.35
Tech, 200 lb bbls	lb. .51	.52	.51	.52	.51	.52
Bismuth metal	lb. 1.05	1.15	1.00	1.10	1.00	1.10
Chloride, boxes	lb. 3.20	3.25	3.20	3.25	3.20	3.25
Hydroxide, boxes	lb. 3.15	3.20	3.15	3.20	3.15	3.20
Oxychloride, boxes	lb.	2.95		2.95	2.75	3.04
Subbenzoate, boxes	lb. 3.25	3.30	3.25	3.30	3.25	3.30
Subcarbonate, kgs	lb. 1.53	1.56	1.13	1.58	1.23	1.58
Trioxide, powd, boxes	lb.	3.57		3.57	3.45	3.57
Subnitrate, fibre, drs	lb. 1.33	1.36	1.03	1.48	1.22	1.48
Blackstrap, cane (see Molasses, Blackstrap).						
Blanc Fixe, 400 lb bbls, wks	ton *h* 40.00	75.00	40.00	75.00	40.00	75.00
Bleaching Powder, 800 lb drs, c-l, wks, contract	100 lb.	2.00		2.00		2.00
lcl, drs, wks	lb. 2.25	3.60	2.25	3.60	2.25	3.60
Blood, dried, f.o.b., NY	unit	3.00	2.50	3.10	3.10	4.30
Chicago, high grade	unit	3.00	2.35	3.35	3.00	4.65
Imported shipt	unit	3.10	2.90	3.45	3.25	4.10
Blues, Bronze Chinese Milori						
Prussian Soluble	lb. .36	.37	.36	.37	.36	.37
Ultramarine,* dry, wks, bbls	lb.	.11		.11	.10	.11
Regular grade, group 1	lb.	.16		.16	.15	.16
Special, group 1	lb.	.19		.19	.18	.19
Pulp, No. 1	lb.	.27		.27	.26	.27
Bone, 4½ + 50% raw, Chicago	ton 28.00	29.00	25.50	30.00	26.00	30.00
Bone Ash, 100 lb kgs	lb. .06	.07	.06	.07	.06	.07
Black, 200 lb bbls	lb. .06½	.08¼	.06½	.08¼	.05½	.08¼
Meal, 3% & 50%, imp	ton	23.00	20.50	23.75	23.75	27.75
Domestic, bgs, Chicago	ton 23.00	24.00	16.00	24.00	19.00	27.00
Borax, tech, gran, 80 ton lots, sacks, delv	ton *i*	43.00	42.00	43.00	40.00	42.00
bbls, delv	ton *i*	53.00	52.00	53.00	50.00	52.00

h Lowest price is for pulp, highest for high grade precipitated; *i* Crystals $6 per ton higher; USP, $15 higher in each case; * Freight is equalized in each case with nearest producing point.

Two new ways to make
FLEXIBLE FILMS

Here are two new materials that present an easy way to make flexible films of Shellac and Casein:
(1) FLEXILAC—*a flexible dewaxed shellac.* An orange-brown, viscous liquid "resin," with a faint, pleasing odor. It dissolves readily in water producing a clear neutral shellac solution. This solution, on drying, forms a film which is characterized by its flexibility. Flexilac is also soluble in alcohol, esters, and ketones. It is insoluble in oils, hydrocarbons and resins. Its total solid content (non-volatile at 105° C) is 44%. Weight 8¾ lbs. per gal. *Prices range from 25c. per lb. in 475 lb. drums.*
(2) PROTOFLEX—*a flexible casein.* A straw colored jelly with faint spicy odor. It disperses quickly in hot water. It is insoluble in organic solvents. Protoflex has a solid content (non-volatile at 105° C) of 45%. Weight about 7 lbs. 10 oz. per gal. *Prices range from 15c. per lb. in 450 lb. drums.*

CHEMICALS BY GLYCO

If Glycerine fails try
YUMIDOL

Have you ever had this trouble with products treated with Glycerine as a plasticizer or softener? When exposed to high degrees of humidity they become soft and warp. In dry weather they lose moisture, shrink and become brittle. That's because of the hygroscopic nature of glycerine. YUMIDOL overcomes this problem because it is much less hygroscopic. It has a higher specific gravity, viscosity and refractive index than Glycerine and can be used for many purposes where glycerine is not good enough.
YUMIDOL, a special grade of Sorbitol, is a polyhydric alcohol having six hydroxyl groups. It is a straw colored viscous liquid completely soluble in water and water-soluble liquids, but insoluble in hydrocarbons, oils, fats, waxes, resins and other water-insoluble materials. It is non-drying, practically non-volatile and has a low freezing point. *Prices range from 18c. per lb. in 600 lb. drums.*

CHEMICALS BY GLYCO

Have you tried
DIGLYCOL LAURATE?
(a water-dispersible oil)

DIGLYCOL LAURATE (Glyco Laurate) is of unusual interest because of its peculiar characteristics. It is a light colored, non-hygroscopic, non-drying oil, soluble in water. It disperses completely on stirring in cold water, and is soluble in alcohol, oils, and hydrocarbon solvents. Its specific gravity 25°/25° C—0.963 to 0.968. Weight per gal. 8 lbs. Diglycol Laurate is being used as an emulsifying agent for making liquid emulsions, a solvent for oil-soluble dyestuffs, a dry-cleaning soap base, a foam reducer in the manufacture of low-foaming, acid precipitated casein, and for many other purposes.

We will gladly send samples and more detailed information about any of these materials.

GLYCO PRODUCTS COMPANY
(Dept. 49)

148 Lafayette St. — New York City

CHEMICALS BY GLYCO

COME TO GLYCO FOR

Diglycol Stearate — Glycerol Monostearate
Diglycol Laurate — Glycol Oleate
Propylene Glycol Stearate (Prostearin)
Propylene Glycol Laurate (Prolaurin)
Propylene Glycol Oleate (Prolein)
Glycol Bori-Borate — Glyceryl Bori-Borate
Ammonium Stearate (Anhydrous)
Glyceryl Monoricinoleate

N.B. The new *Glyco Cosmetic Manual* contains 96 pages packed with practical information and latest data on cosmetics. Many valuable formulae and new ideas. Send for your copy now. Enclose 25c. to cover postage and handling.

	Current Market	1938 Low	1938 High	1937 Low	1937 High
Borax (continued):					
Tech, powd, 80 ton lots, sacks ton *i*	...	47.00	...	47.00	45.00	47.00
bbls, delv ton *i*	...	57.00	...	57.00	56.00	57.00
Bordeaux Mixture, drs lb.	.11	.11½	.11	.11½	.10½	.11
Bromine, cases lb.	.30	.43	.30	.43	.30	.43
Bronze, Al, pwd, 300 lb drs lb.	.90½	.92½	.90½	.92½	.80	1.50
Gold, blk lb.	.45	.65	.45	.65	.40	.65
Butanes, com 16-32° group 3 tks lb.	.02¼	.03¾	.02¼	.03¾	.02¼	.03¾
Butyl, Acetate, norm drs, frt allowed lb.	.09½	.10	.09½	.10½	.10	.10½
tks, frt allowed lb.	...	.08½	.08½	.09	...	.09
Secondary, tks, frt allowed lb.	...	.06½	.06½	.07	.07	.07½
drs, frt, allowed lb.	.07½	.08	.07½	.08½	.08	.09
Aldehyde, 50 gal drs, wks lb.	.16½	.17½	.16½	.17½	.16½	.17½
Carbinol, norm drs, wks lb.	.60	.75	.60	.75	.60	.75
Crotonate, norm, 55 and 110 gal drs, delv lb.	...	.36	...	.36	...	...
Lactate lb.	.22½	.23½	.22½	.23½	.22½	.23½
Oleate, drs, frt allowed lb.	...	.25	...	.25	...	.25
Propionate, drs lb.	.18	.18½	.18	.18½	.18	.18½
tks, delv lb.	...	.17	...	.17	...	.17
Stearate, 50 gal drs lb.	...	.26	...	.26	.25	.26
Tartrate, drs lb.	.55	.60	.55	.60	.55	.60
Butyraldehyde, drs, lcl, wks lb.	...	.35½	...	.35½	...	.35½
Cadmium Metal lb.	...	.95	.95	1.60	1.05	1.60
Sulfide, orange, boxes lb.	.85	.95	.85	1.60	.90	1.60
Calcium, Acetate, 150 lb bgs c-l, delv 100 lb.	...	1.65	...	1.65	1.65	2.25
Arsenate, c-l, E. of Rockies, dealers, drs lb.	.06¾	.07¼	.06¾	.07¼	.06¼	.07¾
Carbide, drs lb.	.05	.06	.05	.06	.05	.06
Carbonate, tech, 100 lb bgs c-l lb.	...	1.00	...	1.00	...	1.00
Chloride, flake, 375 lb drs, burlap bgs, c-l, delv ton	...	22.00	22.00	23.50	22.00	23.50
paper bgs, c-l, delv ton	23.00	36.00	23.00	36.00	...	...
Solid, 650 lb drs, c-l, delv ton	...	20.00	20.00	21.50	20.00	21.50
Ferrocyanide, 350 lb bbls wks lb.	...	.17	...	.17	...	.17
Gluconate, Pharm, 125 lb bbls lb.	.50	.57	.50	.57	.50	.57
Levulinate, less than 25 bbl lots, wks lb.	...	3.00	...	3.00	...	...
Nitrate, 100 lb bgs ton	...	28.00	...	28.00	26.10	28.00
Palmitate, bbls lb.	.22	.23	.22	.23	.22	.23
Phosphate, tribasic, tech, 450 lb bbls lb.	.06½	.07½	.06½	.07½	.06½	.07½
Resinate, precip, bbls lb.	.13	.14	.13	.14	.13	.14
Stearate, 100 lb bbls lb.	.19	.21	.19	.21	.19	.21
Camphor, slabs lb.	.52½	.53	.52½	.56	.54	.56
Powder lb.	.52½	.53	.52½	.56	.54	.56
Carbon Bisulfide, 500 lb drs lb.	.05	.05¾	.05	.05¾	.05	.05¾
Black, c-l, bgs, delv, price varying with zone† lb.	.027	.0380	.027	.0380	.0320	.0535
lcl, bgs, f.o.b. whse lb.	...	.05¾	...	.05¾	.06½	.07
cartons, f.o.b. whse lb.	...	.06¼	...	.06¼	.07	.07¾
cases, f.o.b. whse lb.	...	.07	...	.07	.07¾	.08¼
Decolorizing, drs, c-l lb.	.08	.15	.08	.15	.08	.15
Dioxide, Liq 20-25 lb cyl lb.	.06	.08	.06	.08	.06	.08
Tetrachloride, 55 or 110 gal drs, c-l, delv lb.	.05	.05½	.05	.06	.05¼	.06
Casein, Standard, Dom, grd lb.	.08¾	.09	.06½	.13½	.11	.20¾
80-100 mesh, c-l, bgs lb.	.09¼	.09½	.07	.14	.11½	.21¼
Castor Pomace, 5½ NH_3, c-l, bgs, wks ton	...	18.50	18.50	21.00	21.00	25.00
Imported, ship, bgs ton	...	21.00	...	21.00	nom.	17.00
Celluloid, Scraps, ivory cs lb.	.12	.15	.12	.15	.12	.15
Transparent, cs lb.	...	.20	...	.20	...	.20
Cellulose, Acetate, 50 lb kgs lb.	...	.40	...	.40	.40	.55
Chalk, dropped, 175 lb bbls lb.	.02¾	.03¾	.02¾	.03¾	.03	.03¾
Precip, heavy, 560 lb cks lb.	.02¾	.03¾	.02¼	.04	.03	.04
Light, 250 lb cks lb.	.03¼	.04	.03¼	.04	.03	.04
Charcoal, Hardwood, lump, blk, wks bu.	...	.15	...	.15	...	.15
Softwood, bgs, delv* ton	23.00	34.00	23.00	34.00	23.00	34.40
Willow, powd, 100 lb bbl. wks lb.	.06	.07	.06	.07	.06	.07
Chestnut, clarified, tks, wks lb.	...	.01⅝	.01⅝	.02125	.01625	.02125
25%, bbls, wks lb.	...	.02	.02	.0225	.02	.0225
Pwd, 60%, 100 lb bgs, wks lb.	...	.04½	.04½	.04⅞	...	.04⅞
China Clay, c-l, blk mines ton	...	7.00	...	7.00	6.50	7.00
Imported, lump, blk ton	22.00	25.00	22.00	25.00	22.00	25.00
Chlorine, cyls, lcl, wks, contract lb.	.07½	.08½	.07½	.08½	.07½	.08½
cyls, c-l, contract lb. *j*	...	.05½	...	.05½	...	.05½
Liq, tk, wks, contract 100 lb.	...	2.15	...	2.15	...	2.15
Multi, c-l, cyls, wks, cont lb.	2.30	2.55	2.30	2.55	2.30	2.55
Chloroacetophenone, tins, wks lb.	3.00	3.50	3.00	3.50	3.00	3.50
Chlorobenzene, Mono, 100 lb drs, lcl, wks lb.	.06	.07½	.06	.07½	.06	.07½
Chloroform, tech, 1000 lb drs lb.	.20	.21	.20	.21	.20	.21
USP, 25 lb tins lb.	.30	.31	.30	.31	.30	.31
Chloropicrin; comml cyls lb.	...	.80	...	.80	...	.80
Chrome, Green, CP lb.	.21	.25	.21	.25	.20	.25
Yellow lb.	.14½	.15½	.14½	.15½	.13	.16½

j A delivered price; * Depends upon point of delivery; † New bulk price, tank cars ¼c per lb. less than bags in each zone.

		Current Market	1938 Low	1938 High	1937 Low	1937 High
Chromium, Acetate, 8% Chrome, bbls	lb.	.05	.08	.05	.08	.05	.08
Fluoride, powd, 400 lb bbl	lb.	.27	.28	.27	.28	.27	.28
Coal tar, bbls	bbl.	7.50	8.00	7.50	8.00	6.75	9.00
Cobalt Acetate, bbls	lb.	.65	.67	.65	.68	.58	.68
Carbonate tech, bbls	lb.	...	1.63	...	1.63	1.42¾	1.63
Hydrate, bbls	lb.	...	1.78	1.36	1.78	...	...
Linoleate, solid, bbls	lb.	...	.33	...	.33	.31	.33
paste, 6%, drs	lb.	...	.31	...	.31	...	.31
Oxide, black, bgs	lb.	...	1.67	...	1.67	1.41	1.67
Resinate, fused, bbls	lb.	...	.13½	...	.13½	.13	.13½
Precipitated, bbls	lb.	...	.34	...	.34	.30½	.34
Cochineal, gray or bk bgs	lb.	.35	.38	.35	.38	.32	.38
Teneriffe silver, bgs	lb.	.36	.39	.36	.39	.33	.39
Copper, metal, electrol 100 lb	lb.	...	10.25	9.00	11.00	11.00	16.25
Acetate, normal, bbls, wks	lb.	.21	.23	.21	.23	...	...
Carbonate, 400 lb bbls	lb.	.10½	.11½	.10¼	.11½	.10½	.12½
52-54% bbls	lb.	.14	.15	.1340	.16¾	.15¾	.19
Chloride, 250 lb bbls	lb.	.12½	.13½	.12½	.17	.15	.18
Cyanide, 100 lb drs	lb.	...	.34	.34	.38	.37	.38
Oleate, precip, bbls	lb.	...	.20	...	.20	...	.20
Oxide, black, bbls, wks	lb.	.15	.16	.13½	.17½	.17	.18
red 100 lb bbls	lb.	.15½	.16½	.15	.19775	.17	.19975
Resinate, precip, bbls	lb.	.15	.16	.15	.16	.15	.19
Stearate, precip, bbls	lb.	.23	.24	.23	.24	.23	.40
Sub-acetate verdigris, 400 lb bbls	lb.	.18	.19	.18	.19	.18	.19
Sulfate, bbls, c-l, wks 100 lb.		...	4.40	4.00	4.40	4.25	4.50
Copperas, crys and sugar bulk c-l, wks	ton	...	13.00	12.00	13.00	12.00	13.00
Corn Sugar, tanners, bbls 100 lb.		3.05	3.15	3.00	3.30	3.15	4.34
Corn Syrup, 42°, bbls	100 lb.	...	2.99	2.94	3.16	3.11	4.36
43°, bbls	100 lb.	...	3.04	2.99	3.21	3.16	4.41
Cotton, Soluble, wet, 100 lb bbls	lb.	.40	.42	.40	.42	.40	.42
Cream Tartar, powd & gran, 300 lb bbls	lb.	.22¾	.23¼	.19¾	.23¼	.15	.20¼
Creosote, USP, 42 lb cbys	lb.	.45	.47	.45	.47	.45	.47
Oil, Grade 1, tks	gal.	.13½	.14	.13½	.14	.13	.14
Grade 2	gal.	.122	.132	.122	.132	.113	.132
Cresol, USP, drs	lb.	.10½	.11	.10½	.12½	.10	.13
Crotonaldehyde, 97%, 55 and 110 gal drs, delv	lb.	...	.22	.22	.30	.26	.30
Cutch, Philippine, 100 lb bale	lb.	.04¼	.04½	.04	.06	.04	.04¾
Cyanamid, bgs, c-l, frt allowed Ammonia	unit	...	1.15	...	1.15	1.10	1.15
Derris root 5% rotenone, bbls	lb.	.34	.38	.34	.43	.39	.47
Dextrin, corn, 140 lb bgs f.o.b., Chicago	100 lb.	3.40	3.60	3.35	3.75	3.50	5.00
British Gum, bgs	100 lb.	3.65	3.85	3.60	4.00	3.75	5.25
Potato, Yellow, 220 lb bgs	lb.	.07¼	.08¾	.07¼	.08¾	.07¾	.08¾
White, 220 lb bgs, lcl	lb.	.08	.09	.08	.09	.08	.09
Tapioca, 200 bgs, lcl	lb.	...	.0715	.0715	.08	...	08
White, 140 lb bgs	100 lb.	3.30	3.50	3.30	3.70	4.00	4.58
Diamylamine, c-l, drs, wks	lb.	.47	.75	.47	.75	.47	.75
Diamylene, drs, wks	lb.	.095	.102	.095	.102	.095	.102
tks, wks	lb.	...	.08½	...	.08½	...	.08½
Diamylether, wks, drs	lb.	.085	.092	.085	.092	.085	.092
tks, wks	lb.	...	.075	...	.075	...	.075
Oxalate, lcl, drs, wks	lb.	...	.30	...	.30	...	.30
Diamylphthalate, drs, wks	lb.	.19	.19½	.19	.21	.19	.21½
Diamyl Sulfide, drs, wks	lb.	...	1.10	...	1.10	...	1.10
Diatomaceous Earth, see Kieselguhr.							
Dibutoxy Ethyl Phthalate, drs, wks	lb.	...	.35	...	.35	...	.35
Dibutylamine, lcl, drs, wks	lb.	...	.55	...	.55	...	...
Dibutyl Ether, drs, wks, lcl	lb.	...	.30	...	.30	...	.30
Dibutylphthalate, drs, wks, frt all'd	lb.	.19	.19½	.19	.21	.19½	.21
Dibutyltartrate, 50 gal drs	lb.	.45	.54	.45	.54	.35	.50
Dichlorethylene, drs	lb.	...	.25	...	.25	.25	.29
Dichloroethylether, 50 gal drs, wks	lb.	.15	.16	.15	.16	.15	.16
tks, wks	lb.	...	.14	...	.14	...	.14
Dichloromethane, drs, wks	lb.	...	.23	...	.23	...	.23
Dichloropentanes, drs, wks	lb.	no prices		...	...	...	...
tks, wks	lb.	no prices		...	...	...	...
Diethanolamine, tks, wks	lb.	...	.23	...	.23	.23	.25
Diethylamine, 400 lb drs	lb.	2.75	3.00	2.75	3.00	2.75	3.00
Diethylaniline, 850 lb drs	lb.	.40	.52	.40	.50	.40	.50
Diethyl Carbinol, drs	lb.	.60	.75	.60	.75	.60	.75
Diethylcarbonate, com drs	lb.	.31¾	.35	.31¾	.35	.31¾	.35
Diethylorthotoluidin, drs	lb.	.64	.67	.64	.67	.64	.67
Diethylphthalate, 1000 lb drs	lb.	.19	.19½	.19	.19½	.18	.19½
Diethylsulfate, tech, drs, wks, lcl	lb.	.13	.14	.13	.14	.13	.20
Diethyleneglycol, drs	lb.	.16	.17	.16	.17	.16	.23
Mono ethyl ethers, drs	lb.	.15	.16	.15	.16	.15	.17
tks, wks	lb.	...	.14	...	.14	.14	.15
Mono butyl ether, drs	lb.	.23	.24	.23	.24	.23	.26
tks, wks	lb.	...	.22	...	.22	...	...
Diethylene oxide, 50 gal drs, wks	lb.	.20	.24	.20	.24	.20	.24
Diglycol Oleate, bbls	lb.	...	.21	...	.21	.21	.24
Laurate, bbls	lb.	...	.27½	...	.27½	...	...
Stearate, bbls	lb.	...	.27½	...	.27½	...	...
Dimethylamine, 400 lb drs, pure 25 & 40% sol 100% basis	lb.	...	1.00	...	1.00	...	.95
Dimethylaniline, 340 lb drs	lb.	.26	.27	.26	.27	.26	.27
Dimethyl Ethyl Carbinol, drs	lb.	.60	.75	.60	.75	.60	.75
Dimethyl phthalate, drs, wks, frt allowed	lb.	...	.19	...	.19	.20½	.21
Dimethylsulfate, 100 lb drs	lb.	.45	.50	.45	.50	.45	.50
Dinitrobenzene, 400 lb bbls	lb. *k*	.16	.19	.16	.19	.16	.19

k Higher price is for purified material.

FORMALDEHYDE U. S. P.

A water-white solution of uniform high purity and strength. Protected to the point of use by modern shipping containers.

FINE HEYDEN CHEMICALS

Paraformaldehyde
Hexamethylenetetramine
Salicylic Acid • Methyl Salicylate
Benzoic Acid • Benzoate of Soda
Benzyl Chloride
Benzaldehyde • Tolyl Aldehyde
Benzal Chloride
Creosote • Guaiacol
Bromides

HEYDEN
CHEMICAL CORPORATION
FACTORIES: Garfield, N. J.—Fords, N. J.
NEW YORK—50 Union Square
CHICAGO BRANCH—180 N. Wacker Drive

PARAMET SYNTHETIC RESINS

Synthetic Resins

"PARANOL" (Modified Phenolics)

"ESTEROL" (Alkyds)

"PARADURA" (Pure Phenolics)

"PARAMET" ESTER GUM (All grades)

●

PARAMET CHEMICAL CORPORATION

Manufacturers of Synthetic Resins

44th Avenue & 10th Street

Long Island City, N. Y.

GUMS

GUM ARABIC

GUM KARAYA
(INDIAN GUM)

GUM TRAGACANTH

LOCUST BEAN GUM
(CAROB FLOUR)

• • •

JAPAN WAX

NEW ENGLAND REP
G. H. BUNTON
CAMBRIDGE, MASS.

PHILADELPHIA REP
R. PELTZ & CO.
112 SO. 16TH ST.

PAUL A. DUNKEL & CO., INCORPORATED

82 WALL ST.
NEW YORK, N.Y.

Let us quote on your requirements

Dinitrochlorobenzene
Glauber's Salt

Prices

		Current Market	1938 Low	1938 High	1937 Low	1937 High
Dinitrochlorobenzene, 400 lb bbls	lb.	.13½	.14	.13½	.14	.14	.17½
Dinitronaphthalene, 350 lb bbls	lb.	.35	.38	.35	.38	.35	.38
Dinitrophenol, 350 lb bbls	lb.	.23	.24	.23	.24	.23	.24
Dinitrotoluene, 300 lb bbls	lb.	...	.15½	...	.15½	.14½	.15½
Diphenyl, bbls	lb.	.15	.25	.15	.25	.15	.25
Diphenylamine	lb.	.31	.32	.31	.32	.31	.32
Diphenylguanidine, 100 lb drs	lb.	.35	.37	.35	.37	.35	.37
Dip Oil, see Tar Acid Oil.							
Divi Divi pods, bgs shipmt	ton	.	nom.	...	nom.	34.00	nom.
Extract	lb.	.05¾	.06¾	.05	.06¾	.05	.05½
EGG YOLK							
Egg Yolk, dom., 200 lb cases	lb.	.66	.68	.60	.68	.68	nom.
Imported	lb.	...	nom.	.62	.68	.53	.65
Epsom Salt, tech, 300 lb bbls							
c-l, NY	100 lb.	1.90	2.10	1.90	2.10	1.80	2.10
USP, c-l, bbls	100 lb.	...	2.10	...	2.10	2.00	2.10
Ether, USP anaesthesia 55 lb drs	lb.	.22	.23	.22	.23	.22	.23
(Conc)	lb.	.09	.10	.09	.10	.09	.10
Isopropyl 50 gal drs	lb.	.07	.08	.07	.08	.07	.08
tks, frt allowed	lb.	...	.06	...	.06	...	.06
Nitrous, conc, bottles	lb.	...	.68	...	.68	.68	.77
Synthetic, wks, drs	lb.	.08	.09	.08	.09	.08	.09
Ethyl Acetate, 85% Ester							
tks, frt all'd	lb.	...	.05½	...	.05½	.05½	.06½
drs, frt all'd	lb.	...	.06½	...	.06½	.06½	.07½
95%, tks, frt allowed	lb.	...	.06¾	...	.06¾	...	.06¾
drs, frt all'd	lb.	...	.07¾	...	.07¾	...	.07¾
Acetoacetate, 110 gal drs	lb.	...	.27½	...	.27½	...	.27½
Benzylaniline, 300 lb drs	lb.	.86	.88	.86	.88	.86	.88
Bromide, tech, drs	lb.	.50	.55	.50	.55	.50	.55
Cellulose, drs, wks, frt all'd	lb.	.6440	.9440	.6440	1.00	...	...
Chloride, 200 lb drs	lb.	.22	.24	.22	.24	.22	.24
Chlorocarbonate, cbys	lb.	...	.30	...	.30	...	.30
Crotonate, drs	lb.	1.00	1.25	1.00	1.25	1.00	1.25
Formate, drs, frt all'd	lb.	.27	.28	.27	.28	.27	.31
Lactate, drs, wks	lb.	...	.33	...	.33	...	.33
Oxalate, drs, wks	lb.	.30	.34	.30	.34	.30	.34
Oxybutyrate, 50 gal drs, wks	lb.	.30	.30½	.30	.30½	.30	.30½
Silicate, drs, wks	lb.	...	.77	...	.77	...	.77
Ethylene Dibromide, 60 lb drs	lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys chloro, cont	lb.	.75	.85	.75	.85	.75	.85
Anhydrous	lb.	.	.75	.	.75	.	.75
Dichloride, 50 gal drs, wks	lb.	.0545	.0994	.0545	.0994	.0545	.0994
Glycol, 50 gal drs, wks	lb.	.17	.21	.17	.21	.17	.21
tks, wks	lb.	...	.16	..	.16	..	.16
Mono Butyl Ether, drs, wks	lb.	.20	.21	.20	.21	.20	.21
tks, wks	lb.	...	.19	...	.19	...	.19
Mono Ethyl Ether, drs, wks	lb.	.16	.17	.16	.17	.16	.17
tks, wks	lb.	...	.15	...	.15	...	.15
Mono Ethyl Ether Acetate, drs, wks	lb.	...	.14	...	.14	...	.14
tks, wks	lb.	...	.13	...	.13	...	13
Mono, Methyl Ether, drs wks	lb.	.18	.22	.18	.22	.19	.22
tks, wks	lb.	...	.17	.	.17		.17
Oxide, cyl	lb.	.50	.55	.50	.55	.50	.55
Ethylidenaniline	lb.	.45	.47½	.45	.47½	.45	.47½
Feldspar, blk pottery	ton	17.00	19.00	17.00	19.00		14 50
Powd, blk, wks	ton	14.00	14.50	14.00	14.50	14.00	14.50
Ferric Chloride, tech, crys, 475 lb bbls	lb.	.05	.07½	.05	.07½	.05	.07½
sol, 42° cbys	lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Fish Scrap, dried, unground, wks	unit *l*	...	3.30	2.75	3.30	...	...
Acid, Bulk, 6 & 3%, delv Norfolk & Baltimore basis	unit *m*	...	2.50	2.50	2.50	2.75	3.15
Fluorspar, 98%, bgs	lb.	...	33.00		33.00		no prices
Formaldehyde, USP, 400 lb bbls, wks	lb.	.05¾	.06¼	.05¾	.06¼	.05¾	.06¼
Fossil Flour	lb.	.02½	.04	.02½	.04	.02¼	04
Fullers Earth, blk, mines	ton	10.00	11.00	10.00	11.00	6.50	15.00
Imp powd, c-l, bgs	ton	23.00	30.00	23.00	30.00	23.00	30.00
Furfural (tech) drs, wks	lb.	.10	.15	.10	.15	.10	.15
Furfuramide (tech) 100 lb drs	lb.	.	.30	.	.30		.30
Fusel Oil, 10% impurities	lb.	.12½	.14	.12½	.14	.12½	.18
Fustic, crystals, 100 lb boxes	lb.	.22	.26	.22	.26	.20	.26
Liquid 50°, 600 lb bbls	lb.	.09½	.13	.09½	.13	.08½	.13
Solid, 50 lb boxes	lb.	.17½	.19½	.17½	.19½	.16	.19½
G SALT PASTE							
G Salt paste, 360 lb bbls	lb.	.45	.47	.45	.47	.45	.47
Gall Extract	lb.	.19	.20	.19	.20	19	.20
Gambier, com 200 lb bgs	lb.	.06¾	.07¾	.06¾	.07¾		nom.
Singapore cubes, 150 lb bgs	100 lb.	.08½	.09	.08½	.11	.09½	.10½
Gelatin, tech, 100 lb cs	lb.	.45	.50	.45	.50	45	55
Glauber's Salt, tech, c-l. bgs, wks*	100 lb.	.95	1.15	.95	1.15	.95	1.15
Anhydrous, see Sodium Sulfate.							

l + 10; *m* + 50; *Bbls. are 20c higher.

Current

Glue, Bone Gum, Hemlock

		Current Market		1938 Low	1938 High	1937 Low	1937 High
Glue, bone, com grades, c-l							
bgs	lb.	.13	.15½	.13	.16½	.11	.17½
Better grades, c-l. bgs	lb.	.14½	.16½	.14½	.16½	.12½	.17½
Glycerin, CP, 550 lb drs	lb.	...	.14¼	.14¼	.16	.15½	.29
Dynamite, 100 lb drs	lb.	.12¾	.13¼	.12¾	.16	.15½	.29
Saponification, drs	lb.	.09½	.09¾	.09½	.11¼	.11	.29
Soap Lye, drs	lb.	.08½	.08¾	.08½	.10¼	.10	.27
Glyceryl Bori-Borate, bbls	lb.	...	.40	...	.40	...	...
Monoricinoleate, bbls	lb.	...	.27	...	.27	...	...
Monostearate, bbls	lb.	...	.30	...	.30	...	...
Oleate, bbls	lb.	...	.22	...	.22	...	...
Phthalate	lb.	...	.37	...	.37	.29	.37
Glyceryl Stearate, bbls	lb.	...	.18	...	.18	.	.18
Glycol Bori-Borate, bbls	lb.	...	.26	...	.26	.	.
Phthalate, drs	lb.	...	.40	...	.40	.29	.40
Stearate, drs	lb.	...	.27½	...	.27½	.23	.27½
GUMS							
Gum Aloes, Barbadoes	lb.	.85	.90	.85	.90	.85	.90
Arabic, amber sorts	lb.	.09½	.09¾	.09¼	.12	.10½	.15½
White sorts, No. 1, bgs	lb.	.23	.24	.23	.28	.24	.30
No. 2, bgs	lb.	.21	.22	.21	.26	.22	.28
Powd, bbls	lb.	.12½	.12½	.12	.16	.14	.19
Asphaltum, Barbadoes (Manjak) 200 lb bgs, f.o.b., NY	lb.	02½	.10½	.02½	.10½	.02½	.10½
California, f.o.b., NY, drs	ton	29.00	55.00	29.00	55.00	29.00	55.00
Egyptian, 200 lb cases, f.o.b., NY	lb.	.12	.15	.12	.15	.12	.15
Benzoin Sumatra, USP, 120 lb cases	lb.	.23	.25	.15	.25	.15	.25
Copal, Congo, 112 lb bgs, clean, opaque	lb.	...	.18¾	.18¼	.19¼	.18⅞	.19¼
Dark amber	lb.	...	.07½	.07½	.08⅞	.06⅞	.09¼
Light amber	lb.	...	.11⅞	.11⅞	.13¼	.10¼	.14⅜
Copal, East India, 180 lb bgs							
Macassar pale bold	lb.	...	.12⅛	.12⅛	.13	.	.13
Chips	lb.	...	.05⅜		.05⅜	.05⅜	.06½
Dust	lb.	.03¼	.04	.03½	.04⅛	.03⅝	.04⅛
Nubs	lb.	...	.09⅛	.09⅛	.10⅜	.10⅜	.11¼
Singapore, Bold	lb.	...	.14½	.14½	.15¼	.15¼	.15⅝
Chips	lb.	...	.05⅜	.04¾	.05⅜	.04¼	.05
Dust	lb.	.03¼	.04	.03¼	.04⅛	.03⅝	.04⅛
Nubs	lb.	...	.10		.10	.10	.10¾
Copal Manilla, 180-190 lb baskets, Loba A	lb	...	.11¼	.11¼	.12	.09¾	.12
Loba B	lb.	...	.10¼	.10¼	.11⅝	.09¼	.11⅝
Loba C	lb.	...	.09¾	.09¾	.11¼	.08⅞	.11¼
DBB	lb.	...	.08	.08	.08¾	.08	.08¾
Dust	lb.	...	.05⅛	.05⅛	.06⅝	.05¾	.06⅝
MA sorts	lb.	...	.06⅝	.05⅞	.07¼	.06¾	.07¼
Copal Pontianak, 224 lb cases, bold genuine	lb.	...	.15¼	.15¼	.16½	.15½	.16½
Chips	lb.	...	.08⅝	.08⅝	.10¼	.09⅛	.11⅛
Mixed	lb	...	.14		.14	.13½	.14
Nubs	lb.	...	.11¾	.11¾	.12⅞	.12¾	.13½
Split	lb.	...	.13⅞		.13⅞	.13½	.15¼
Dammar Batavia, 136 lb cases							
A	lb.	...	.20⅞	.20⅞	.25½	.23½	.25½
B	lb.	...	.19⅜	.19⅜	.24	.22⅛	.24
C	lb.	...	.15¾	.15¾	.20⅜	.18½	.20⅜
D	lb.	...	.13¾	.13¾	.17½	.15¼	.17½
A/D	lb.	...	.16⅛	.16⅛	.20⅜	.17⅝	.20⅜
A/E	lb.	...	.13½	.13½	.17¼	.14⅞	.17¼
E	lb.	...	.07⅜	.07⅜	.08½	.07⅞	.08½
F	lb.	...	.07¼		.07¼	.06¼	.07¼
Singapore, No. 1	lb.	...	.15⅝	.15⅝	.21⅛	.17⅛	.21½
No. 2	lb.	...	.10¾	.10⅜	.15⅜	.14⅛	.16¼
No. 3	lb.	...	.05	.05	.05¾	.	.05¾
Chips	lb.	...	.10⅝	.10⅝	.13½	.10¼	.13½
Dust	lb.	...	.05	.05	.05¾	.05¾	.06
Seeds	lb.	...	.07¾	.07¾	.09½	.07⅛	.09½
Elemi, cns., c.l.	lb.	...	.08⅛	.08⅛	.09½	.09⅜	.10¼
Ester	lb.	.06¼	.07	.06¼	.08½	.09	.12
Gamboge, pipe, cases	lb.	.60	.65	.60	.80	.58	.80
Powd, bbls	lb.	.65	.70	.65	.85	.65	.85
Ghatti, sol bgs	lb.	.11	15	.11	.15	.11	.15
Karaya, bbls., bxs., drs.,	lb.	.14½	.23	...	...	...	...
Kauri, NY, Brown XXX, cases	lb.	.60	.60½	.60	.60½	.60	.60½
BX	lb.	...	.38	...	.38	.33	.38
B1	lb.	...	.28	...	.28	.21	.28
B2	lb.	...	.24	...	.24	.15½	.26
B3	lb.	...	.18½	...	.18½	.12	.18½
Pale XXX	lb.	...	.61	...	.61	.61	.65½
No. 1	lb.	...	.41	...	.41	.40	.41
No 2	lb.	...	.24	...	.24	.22	.24
No. 3	lb.	...	.17¾	...	.17¾	.15	.17¾
Kino, tins	lb.	2.50	2.75	2.00	2.75	.70	2.10
Mastic	lb.	.55	.56	.55	.56	.55	.58
Sandarac, prime quality, 200 lb bgs & 300 lb cks	lb.	.25	.26	.24	.26	.25	.35
Senegal, picked bags	lb.	.25	.27	.23	.27	.20	.29
Sorts	lb.	.09¼	.09½	.09¼	.12	.09¾	.15
Thus, bbls	280 lbs.	14.00	14.25	13.50	14.25	12.00	14.00
Strained	280 lbs.	14.00	14.25	.	14.25	12.00	14.00
Tragacanth, No. 1, cases	lb.	2.65	2.70	2.65	3.00	2.40	3.25
No. 2	lb.	2.35	2.40	2.35	2.75	2.00	2.75
No. 3	lb.	2.30	2.35	2.30	2.70	1.95	2.70
No. 4	lb.	2.25	2.30	2.25	2.65	1.85	2.65
No. 5	lb.	2.20	2.25	2.20	2.50	1.65	2.50
Yacca, bgs	lb.	.03½	.04½	.03½	04½	.03¼	.04½
Helium, cyl (200 cu. ft.)	cyl.	.	25.00	.	25.00	.	25.00
Hematine crystals, 400 lb bbls	lb.	.18	.34	.18	.34	.16	.34
Hemlock, 25%, 600 lb bbls, wks	lb.	.03	.03¼	.03	.03¼	.03	.03¼
tks	lb.	...	.02⅝	.02⅝	.02¾	...	.02¾

TURNER Chemicals are backed by 75 years of experience — insuring you a uniform product of the highest standard — yet priced to meet competition.

Caustic Potash
Caustic Soda
Potassium Carbonate
Oxalic Acid
Phosphorus Compounds
Sodium Chlorate
Bleaching Powder
Persulphate of Ammonia
Persulphate of Potash
Aluminum Stearate
Calcium Stearate
Zinc Stearate U. S. P.
White Oils
Petrolatum
Insecti-Sol
(Colorless, Odorless Insecticide Base)

LIQUID CAUSTIC SODA

We maintain local delivery tank truck service throughout the Metropolitan New York area.

JOSEPH TURNER & CO.
RIDGEFIELD, NEW JERSEY

83 Exchange Pl., Providence, R. I.; 630 Fifth Ave., New York, N. Y.
40th St. & Calumet Ave., Chicago, Ill.

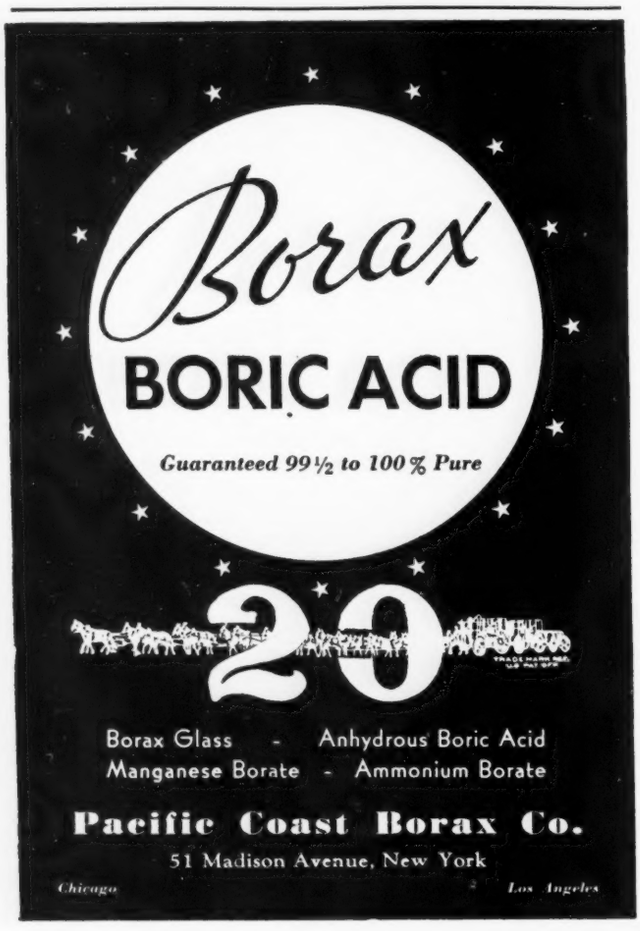
Serving the Chemical Industry for over 75 years

CHEMICALS

NICHOLS
Copper Sulphate
TRIANGLE BRAND
Recommended for Purity & Uniformity
99% Pure
Large or Small Crystals and Pulverized—also Monohydrated. Packed in 100-lb. waterproof bags and 300-lb. barrels.
COPPER OXIDE (Red)
NICKEL SULPHATE

PHELPS DODGE REFINING CORPORATION

Sales Offices: 40 Wall St., New York, 230 N. Michigan Ave., Chicago
Works: Laurel Hill, New York, El Paso, Texas



Hexalene
Manganese Sulfate

Prices

		Current Market	1938 Low	1938 High	1937 Low	1937 High
Hexalene, 50 gal drs, wks	lb.	...	.30	...	.30	...	.30
Hexane, normal 60-70° C. Group 3, tks	gal.	...	.10½	...	.10½	...	.10½
Hexamethylenetetramine, powd, drs	lb.	.35	.36	.35	.36	.35	.36
Hexyl Acetate, secondary, delv, drs	lb.	.13	.13½	.13	.13½	.13	.13½
tks	lb.	...	.12	...	.12	...	.12
Hoof Meal, f.o.b. Chicago unit		...	2.50	2.35	3.35	3.20	3.75
Hydrogen Peroxide, 100 vol, 140 lb cbys	lb.	.19½	.20	.19½	.20	.20	.21
Hydroxylamine Hydrochloride	lb.	...	3.15	...	3.15	...	3.15
Hypernic, 51°, 600 lb bbls	lb.	.16	.21	.16	.21	.15	.21
INDIGO							
Indigo, Bengal, bbls	lb.	...	2.40	...	2.40	...	2.40
Synthetic, liquid	lb.	.16½	.19	.16½	.19	.16½	.19
Iodine, Resublimed, jars	lb.	...	1.75	1.50	1.75	1.50	1.60
Irish Moss, ord, bales	lb.	.10	.11	.10	.11	.11	.12
Bleached, prime, bales	lb.	.19	.20	.19	.20	.19	.21
Iron Acetate Liq. 17°, bbls, delv	lb.	.03	.04	.03	.04	.03	.04
Chloride see Ferric Chloride.							
Nitrate, coml, bbls 100 lb.		2.32	3.11	2.32	3.11	2.32	3.25
Isobutyl Carbinol (128-132° C) drs, wks	lb.	.33	.34	.33	.34	.33	.34
tks, wks	lb.	...	.32	...	.32	...	.32
Isopropyl Acetate, tks, frt all'd	lb.	...	.05½	...	.05½	.05½	.06½
drs, frt all'd	lb.	.06½	.07	.06½	.07	.06½	.08
Ether, see Ether, isopropyl.							
Keiselguhr, dom bags, c-l, Pacific Coast	ton	22.00	85.00	22.00	85.00	22.00	85.00
LEAD ACETATE							
Lead Acetate, f.o.b. NY, bbls, White, broken	lb.	...	.10	.10	.11	.11	.13½
cryst, bbls	lb.	...	.10	.10	.11	.11	.13½
gran, bbls	lb.	...	.10¾	.10¾	.11¾	.11¾	.14¼
powd, bbls	lb.	...	.10¾	.10¾	.11¾	.11¾	.14¼
Arsenate, East, drs	lb.	.11	.11½	.11	.13½	.11	.13½
Linoleate, solid, bbls	lb.	...	.19	...	.19	.18	.19
Metal, c-l, NY	100 lb.	...	5.10	4.00	5.10	4.75	7.05
Nitrate, 500 lb bbls, wks	lb.	.10	.11½	.10	.11½	.09	.11½
Oleate, bbls	lb.	.18½	.20	.18½	.20	.15	.20
Red, dry, 95% Pb_3O_4, delv	lb.	.076	.0785	.06½	.0785	.07¼	.0945
97% Pb_3O_4, delv	lb.	.0785	.081	.06¾	.081	.07½	.0934
98% Pb_3O_4, delv	lb.	.081	.0835	.07	.0835	.07¾	.10
Resinate, precip, bbls	lb.	...	.16½	...	.16½	.14	.16½
Stearate, bbls	lb.	.22	.23	.22	.23	.22	.23
Titanate, bbls, c-l, f.o.b. wks, frt all'd	lb.	.11	.11½	.11	.11½	.10	.12
White, 500 lb bbls, wks	lb.	...	.06¾	.06	.06¾	.06¾	.09
Basic sulfate, 500 lb bbls, wks	lb.	...	.06	.05¼	.06¼	.06¼	.08¾
Lime, chemical quicklime, f.o.b., wks, bulk	ton	7.00	8.00	7.00	8.00	6 00	8.00
Hydrated, f.o.b., wks	ton	8.50	12.00	8.50	12.00	8.00	12.00
Lime Salts, see Calcium Salts.							
Lime sulfur, dealers, tks	gal.	.08	.11½	.08	.11½	.	.11
drs	gal.	.11	.16	.11	.16	.13	.16
Linseed Meal, bgs	ton	...	41.50	39.00	45.00	35.00	42.50
Litharge, coml, delv, bbls	lb.	...	.066	.05½	.066	.06¼	.08½
Lithopone, dom, ordinary, delv, bgs	lb.	...	.04⅛	.04⅛	.04⅝	.04¼	.04⅝
bbls	lb.	...	.04⅜	.04⅜	.04⅞	.04½	.04⅞
High strength, bgs	lb.	...	.05⅝	.05⅝	.06⅛	.05¾	.06⅛
bbls	lb.	...	.05⅞	.05⅞	.06⅜	.06	.06⅜
Titanated, bgs	lb.	...	.05⅝	.05⅝	.06⅛	.05¾	.06⅛
bbls	lb.	...	.05⅞	.05⅞	.06⅜	.06	.06⅜
Logwood, 51°, 600 lb bbls	lb.	.09½	.11½	.09½	.11½	.08½	.11½
Solid, 50 lb boxes	lb.	.15	.19	.15	.19	.15	.17½
Sticks	ton	24.00	25.00	24.00	25.00	24.00	25.00
MADDER							
Madder, Dutch	lb.	.22	.25	.22	.25	.22	.25
Magnesite, calc, 500 lb bbl	ton	60.00	65.00	60.00	65.00	60.00	65.00
Magnesium Carb, tech, 70 lb bgs, wks	lb.	.05¾	.06½	.05¾	.07	.06	.07
Chloride flake, 375 lb drs, c-l, wks	ton	39.00	42.00	39.00	42.00	39.00	42.00
Fluosilicate, crys, 400 lb bbls, wks	lb.	.10	.10½	.10	.10½	.10	.10½
Oxide, calc tech. heavy bbls, frt all'd	lb.	.25	.30	.25½	.30½	...	...
Light, bbls, above basis	lb.	.20	.25	.20	.25½	...	...
USP Heavy, bbls, above basis	lb.	.25	.30	.25	.30½	...	...
Palmitate, bbls	lb.	.33	nom.	.	.33	.33	nom.
Silicofluoride, bbls	lb.	.09½	.10½	.09½	.10½	.09½	.10½
Stearate, bbls	lb.	.21	.24	.21	.24	.21	.24
Manganese acetate, drs	lb.	.	.26½	.	.26½	.25½	.26½
Borate, 30%, 200 lb bbls	lb.	.15	.16	.15	.16	.15	.16
Chloride, 600 lb cks	lb.	.09	.12	.09	.12	.09	.12
Dioxide, tech (peroxide), paper bgs, c-l	ton	...	54.50	54.50	62.50	47.50	62.50
Hydrate, bbls	lb.	.	.32	.	.32	.	.32
Linoleate, liq, drs	lb.	.18	.19¼	.18	.19¼	.18	.19¼
solid, precip, bbls	lb.	.	.19	.	.19	.17½	.19
Resinate, fused, bbls	lb.	.08¼	.08½	.08¼	.08½	.08¼	.08½
precip, drs	lb.	...	.12	...	.12	...	.12
Sulfate, tech, anhyd, 90-95%, 550 lb drs	lb.	.07	.07½	.07	.07½	.07	.07½

	Current Market	1938 Low	1938 High	1937 Low	1937 High
Mangrove, 55%, 400 lb bbls lb.	...	.04	.04	...	.04
Bark, African ton	...	26.00	24.50	26.00	25.00	27.00
Mannitol, pure cryst, cs, wks lb.	...	1.30	1.30	1.45	1.45	1.48
Marble Flour, blk ton	12.00	13.00	12.00	13.00	12.00	13.00
Mercury chloride (Calomel) lb.	...	1.28	1.18	1.59	1.05	1.60
Mercury metal ...76 lb. flasks	...	77.00	75.00	84.50	81.00	99.00
Meta-nitro-aniline lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-paratoluidine 200 lb bbls lb.	1.45	1.55	1.45	1.55	1.45	1.55
Meta-phenylene diamine 300 lb bbls lb.	.80	.84	.80	.84	.80	.84
Meta-toluene-diamine, 300 lb bbls lb.	.65	.67	.65	.67	.65	.67
Methanol, denat, grd, drs, c-l, frt all'd gal.	...	.30	.30	.36	.36	.53
tks, frt all'd gal.	...	.25	.25	.30	.30	.48
Pure, drs, c-l, frt all'd gal.	...	.38	...	.38	..	.38
tks gal.	...	.33	...	.33	...	.33
95%, tks gal.	...	.31	...	.31	...	.31
97%, tks gal.	...	.32	...	.32	..	.32
Methyl Acetate, tech, tks, delv lb.	...	.06½	...	.06½	...	...
55 gal drs, delv lb.	.07½	.08	.07½	.08	...	...
C.P. 97-99%, tks, delv lb.	..	.07	..	.07	...	...
55 gal drs, delv lb.	.08	.08½	.08	.08½	..	..
Acetone, frt all'd, drs gal. *p*	.30	.36	.30	.40½	.34½	.58½
tks, frt all'd, drs gal. *p*	.25	.29	.25	.32½	.28½	.44½
Synthetic, frt all'd, east of Rocky M., drs gal. *p*	.38	.41	.38	.51	.42	.59½
tks, frt all'd gal.	...	.31½	.31½	.39½	.36	.49½
West of Rocky M., frt all'd, drs gal. *p*	...	.42	.42	.46	.46	.58
tks, frt all'd gal. *p*	...	.35	.35	.39½	.39½	.51
Anthraquinone lb.	.65	.67	.65	.67	.65	.67
Butyl Ketone, tks lb.	...	.10½	...	.10½	...	.10½
Chloride, 90 lb cyl lb.	.32	.40	.32	.40	.32	.43
Ethyl Ketone, tks, frt all'd lb.	...	.05½	.05½	.06	...	.07½
50 gal drs, frt all'd c-l lb.	...	.06½	.06½	.07	...	...
Formate, drs, frt all'd lb.	.35	.36	.35	.36	.35	.39
Hexyl Ketone, pure, drs lb.	...	.60	...	.60	...	.60
Lactate, drs, frt all'd lb.	...	.30	...	.30	...	.30
Propyl carbinol, drs lb.	.60	.75	.60	.75	.60	.75
Mica, dry grd, bgs, wks lb.	...	30.00	30.00	35.00	...	35.00
Michler's Ketone, kgs lb.	...	2.50	...	2.50	...	2.50
Molasses, blacksrap, tks, f.o.b. NY gal.	...	.07	...	.07	.07	.07¼
Monoamylamine, c-l, drs, wks lb.	.52	1.00	.52	1.00	.52	1.00
Monobutylamine, lcl, drs, wks lb.	...	.65	...	.65	...	...
Monochlorobenzene, see Chlorobenzene, mono.						
Monoethanolamine, tks, wks lb.	...	.23	...	.23	.25	.30
Monomethylamine, drs, frt all'd, E. Mississippi, c-l lb.	...	.65	...	.65	...	.65
Monomethylparaminosulfate, 100 lb drs lb.	3.75	4.00	3.75	4.00	3.75	4.00
Myrobalans 25%, liq bbls lb.	.03¾	.04¼	.03¾	.04¼	...	.04¼
50% Solid, 50 lb boxes lb.	.04⅜	.05	.04⅜	.06¼	.06	.06¼
I1 bgs ton	...	29.00	27.00	30.00	26.50	30.00
I2 bgs ton	...	20.50	19.50	22.00	19.00	22.50
R2 bgs ton	...	17.00	17.00	22.00	18.75	22.00
NAPHTHA						
Naphtha, v.m.&p. (deodorized) see petroleum solvents.						
Naphtha, Solvent, water-white, tks gal.	...	.26	.26	.31	...	.31
drs, c-l gal.	...	.31	.31	.36	...	.36
NAPHTHALENE						
Naphthalene, dom, crude, bgs, wks lb.	2.35	2.85	2.35	2.85	2.00	3.00
Imported, cif, bgs lb.	1.40	1.85	1.40	2.25	2.20	3.00
Balls, flakes, pks lb.	...	.07½	.07½	.08	...	.08
Balls, ref'd, bbls, wks lb.	...	.06¾	.06¾	.07¼	...	.07¼
Flakes, ref'd, bbls, wks lb.	...	.06¾	.06¾	.07¼	...	.07¼
Nickel Carbonate, bbls lb.	.36	.37½	.36	.37½	.36	.37½
Chloride, bbls lb.	.18	.20	.18	.20	.18	.20
Metal ingot lb.	...	.35	...	.35	...	.35
Oxide, 100 lb kgs, NY lb.	.35	.37	.35	.37	.35	.37
Salt, 400 lb bbls, NY lb.	.13	.13½	.13	.13½	.13	.13½
Single, 400 lb bbls, NY lb.	.13	.13½	.13	.13½	.13	.13½
Nicotine, 40%, drs, sulfate, 55 lb drs lb.	...	.76	...	.76	...	.76
Nitre Cake, blk ton	...	16.00	...	16.00	...	16.00
Nitrobenzene, redistilled, 1000 lb drs, wks lb.	.08	.10	.08	.10	.08	.10
tks lb.	...	.07½	...	.07½	...	.07½
Nitrocellulose, c-l, l-c-l, wks lb.	.22	.29	.22	.29	.26	.29
Nitrogen Sol. 45½% ammon., f.o.b. Atlantic & Gulf ports, tks, unit ton	...	1.03	1.01	1.03	...	...
Nitrogenous Mat'l, bgs, imp unit	...	2.65	2.35	2.65	2.55	3.55
dom, Eastern wks unit	...	2.60	2.50	2.75	2.50	4.25
dom, Western wks unit	...	2.25	2.20	2.35	2.25	3.75
Nitronaphthalene, 550 lb bbls lb.	.24	.25	.24	.25	.24	.25
Nutgalls Alleppo, bgs lb.	no prices		...	...	.20	.22
Chinese, bgs lb.	no prices		...	...	.20	.22
OAK BARK						
Oak Bark Extract, 25%, bbls lb.	...	.03⅛	...	.03⅛	...	.03⅛
tks lb.	...	.02¾	...	.02¾	...	.02¾
Octyl Acetate, tks, wks lb.	.16	.17	.16	.17	.16	.17

o Country is divided in 4 zones, prices varying by zone; *p* Country is divided into 4 zones. Also see footnote directly above; *q* Naphthalene quoted on Pacific Coast F.A.S. Phila. or N. Y.

GREEFF

Industrial and Pharmaceutical Chemicals

ISOPROPYL ALCOHOL
ISOPROPYL ETHER
DIACETONE
METHYL ETHYL KETONE

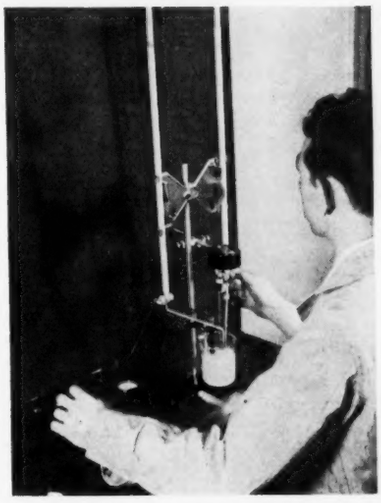
•

Selling Agents for Shell Chemical Company

R.W. GREEFF & CO.
10 East 40th Street, New York

FOOTE LITHIUM

CITRATE • BENZOATE • CARBONATE
CHLORIDE • FLUORIDE • NITRATE



Potentiometric Assay of Lithium Citrate

FOOTE MINERAL CO.
Office: 1601 Summer Street Philadelphia, Pa.

SUNSHINE STATE POTASH
A PRODUCT OF NEW MEXICO U.S.A.
REG. U. S. PAT. OFF.

MURIATE OF POTASH
62/63% K_2O, ALSO 50% K_2O

MANURE SALTS
Approximately 30% K_2O

UNITED STATES
POTASH COMPANY
INCORPORATED
30 Rockefeller Plaza
New York, N. Y.

Barium Chloride Crystals
Free of Sulphides
Uniform Quality

BARIUM REDUCTION CORP.
SOUTH CHARLESTON, W. VA.

MANGANESE CHLORIDE
DELIVERIES FROM SPOT STOCKS

JUNGMANN & CO.
INCORPORATED
Industrial and Fine Chemicals-Raw Materials
157 CHAMBERS STREET
TEL. BARCLAY 7-5128-30 NEW YORK CITY

Orange-Mineral Phenylhydrazine Hydrochloride — Prices

	Current Market	1938 Low	1938 High	1937 Low	1937 High
Orange-Mineral, 1100 lb cks NY lb.	...	.10½	.09½	.10½	.10¼	.12¾
Orthoaminophenol, 50 lb kgs lb.	2.15	2.25	2.15	2.25	2.15	2.25
Orthoanisidine, 100 lb drs lb.	.70	.74	.70	.74	.70	.74
Orthochlorophenol, drs ... lb.	...	.32	.32	.75	.35	.75
Orthocresol, drs, wks ... lb.	.16½	.17½	.13½	.17½	.13½	.14½
Orthodichlorobenzene, 1000 lb drs ... lb.	.06	.07	.06	.07	.05	.07
Orthonitrochlorobenzene, 1200 lb drs, wks ... lb.	.15	.18	15	.18	.28	.29
Orthonitroparachlorphenol, tins ... lb.	...	.75	...	.75	.70	.75
Orthonitrophenol, 350 lb drs ... lb.	.85	.90	.85	.90	.85	.90
Orthonitrotoluene, 1000 lb drs, wks lb.	.08	.10	.08	.10	.07	.10
Orthotoluidine, 350 lb bbls, l-c-l ... lb.	.16	.17	.16	.17	.14	.17
Osage Orange, cryst, bbls ... lb.	.17	.25	.17	.25	.17	.25
51° liquid ... lb.	.07	.08	.07	.08	.07	.08
Paraffin, rfd, 200 lb bgs 122-127° M P ... lb.	.03¾	.039	.03¾	.04½	.0445	.04½
128 132° M P ... lb.	.04	.0435	.04	.049	.04¾	.049
133-137° M P ... lb.	...	.0465	.0465	.05¾	.05½	.05¾
Para aldehyde, 99%, tech, 110-55 gal drs, delv ... lb.	...	.16	.16	.18	.16	.18
Aminoacetanilid, 100 lb kgs lb.	...	.85	...	.85	...	.85
Aminohydrochloride, 100 lb kgs lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kgs lb.	...	1.05	...	1.05	...	1.05
Chlorophenol, drs lb.	.30	.45	.30	.45	.30	.45
Dichlorobenzene, 200 lb drs, wks lb.	.11	.12	.11	.12	.11	.20
Formaldehyde, drs, wks lb.	.34	.35	.34	.35	.34	.35
Nitroacetanilid, 300 lb bbls lb.	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls, wks lb.	.45	.47	.45	.47	.45	.47
Nitrochlorobenzene, 1200 lb drs, wks lb.	.15	.16	.15	.16	.23½	.24
Nitro-orthotoluidine, 300 lb bbls lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol, 185 lb bbls lb.	.35	.37	.35	.37	.35	.37
Nitrosodimethylaniline, 120 lb bbls lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls lb.	...	.35	...	.35	...	.35
Phenylenediamine, 350 lb bbls lb.	1.25	1.30	1.25	1.30	1.25	1.30
Toluenesulfonamide, 175 lb bbls lb.	.70	.75	.70	.75	.70	.75
tks, wks lb.	...	.31	...	.31	...	.31
Toluenesulfonchloride, 410 lb bbls, wks lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls, wks lb.	.56	.58	.56	.58	.56	.58
Paris Green, dealers, drs lb.	.23	.26	.23	.26½	.22	.26½
Pentane, normal, 28-38° C, group 3, tks gal.	...	.08½	...	.08½	.08½	.09½
drs, group 3 gal.	.11½	.16	.11½	.16	.12½	.16
Perchlorethylene, 100 lb drs, frt all'd lb.	...	.10½	...	.10½	...	.10½
Petrolatum, dark amber, bbls lb.	.02⅝	.02¾	.02⅝	.03⅞	.02⅝	.03
Light, bbls ... lb.	.03⅛	.03⅜	.03⅛	.03⅜	.03⅛	.03¾
Medium, bbls ... lb.	.02⅞	.03⅛	.02⅞	.03⅛	.02⅞	.03⅛
Dark green, bbls ... lb.	.02½	.02¾	.02½	.02¼	.02½	.02¾
Red, bbls ... lb.	.02½	.03⅝	.02½	.03⅝	.02⅛	.03¾
White, lily, bbls ... lb.	.05¼	.07⅛	.05¼	.07⅛	.06	.06¼
White, snow, bbls lb.	.06¼	.08⅛	.06¼	.08⅛	.07	.07¼
Petroleum Ether, 30-60°, group 3, tks ... gal.	...	.13	...	.13	...	.13
drs, group 3 ... gal.	.14	.17	.14	.17	.15	.17

PETROLEUM SOLVENTS AND DILUENTS

Cleaners naphthas, group 3, tks, wks gal.	.06⅜	.06⅝	.06⅜	.07⅜	.06⅞	.07⅞
East Coast, tks, wks gal.	...	.10	...	.10	.09½	10
Hydrogenated, naphthas, frt all'd East, tks ... gal.	...	.16	...	.16	...	.16
No. 2, tks ... gal.	...	.18	...	.18	...	.18
No. 3, tks ... gal.	...	.16	...	.16	...	.16
No. 4, tks ... gal.	...	.18	...	.18	...	.18
Lacquer diluents, tks, Bayonne ... gal.	.12	.12½	.12	.12½	.12	.12½
Group 3, tks gal.	.07⅜	.07⅝	.07⅜	.08⅜	.07⅞	.08⅞
Naphtha, V.M.P., East, tks, wks gal.	...	.10	.10	.11	.10	.11
Group 3, tks, wks gal.	.06⅜	.06⅝	.06⅜	.07⅜	.06⅞	.07⅞
Petroleum thinner, 43-47, East, tks, wks gal.	.09	.10	.09	.10	.09	.10
Group 3, tks, wks gal.	.05⅜	.05⅝	.05⅜	.06⅜	.05⅞	.06⅞
Rubber Solvents, stand grd, East, tks, wks gal.	.09½	.10	.09½	.10	.09½	.10
Group 3, tks, wks gal.	.06⅜	.06⅝	.06⅜	.07⅜	.06⅞	.07⅞
Stoddard Solvent, East, tks, wks gal.	...	.10	.09½	.10	.09½	.10
Group 3, tks, wks gal.	.05⅞	.06⅛	.05⅞	.06⅞	.06⅜	.07⅜
Phenol, 250-100 lb drs lb.	.14½	.15½	.14½	15½	.13¼	.15½
tks, wks lb	...	.13½	...	.13½	.12¾	.13½
Phenyl-Alpha-Naphthylamine, 100 lb kgs lb.	...	1.35	...	1.35	...	1.35
Phenyl Chloride, drs lb.	...	.17	...	.17	.16	.17
Phenylhydrazine Hydrochloride, com lb.	...	1.50	...	1.50	...	1.50

Current

Phloroglucinol
Rosin Oil

		Current Market	1938 Low	1938 High	1937 Low	1937 High
Phloroglucinol, tech, tins	lb.	15.00	15.00	16.50	15.00	16.50
CP, tins	lb.	20.00	20.00	22.00	20.00	22.00
Phosphate Rock, f.o.b. mines						
Florida Pebble, 68% basis	ton	...	...	1.85	...	1.85
70% basis	ton	...	...	2.35	...	2.35
72% basis	ton	...	...	2.85	...	2.85
75-74% basis	ton	...	...	3.85	...	3.85
75% basis	ton	...	...	5.50	...	5.50
Tennessee, 72% basis	ton	..	...	4.50	...	4.50
Phosphorus Oxychloride 175						
lb cyl	lb.	.16	.16	.20	.16	.20
Red, 110 lb cases	lb.	.40	.40	.44	.40	.44
Sesquisulfide, 100 lb cs	lb.	.38	.38	.44	.38	.44
Trichloride, cyl	lb.	.15	.15	.18	.15	.20
Yellow, 110 lb cs, wks	lb.	.24	.24	.30	.24	.33
Phthalic Anhydride, 100 lb						
drs, wks	lb.	...	...	.14½	.14½	.15½
Pine Oil, 55 gal drs or bbls						
Destructive dist	lb.	.52	.52	.55	.49	.65
Steam dist wat wh bbls	gal.	...	...	.59	.59	.79
tks	gal.	...	...	.54	.54	.74
Pitch Hardwood, wks	ton	18.25	18.25	18.75	15.00	18.75
Coaltar, bbls, wks	ton	...	...	19.00	...	19.00
Burgundy, dom, bbls, wks	lb.	.05½	.05½	.06½	.03½	.06½
Imported	lb.	.15	.15	.16	.11	.16
Petroleum, see Asphaltum in Gums' Section.						
Pine, bbls	bbl.	6.00	5.75	6.25	5.75	6.50
Stearin, drs	lb.	.03	.03	.04½	.03	.04½
Platinum, ref'd	oz.	35.00	32.00	39.00	32.00	68.00

POTASH

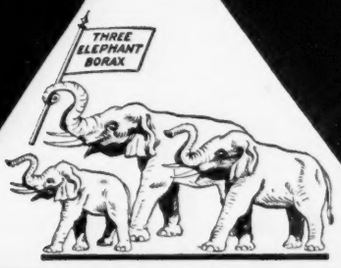
Potash, Caustic, wks, sol	lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
flake	lb.	.07	.07⅛	.07	.07⅛	.07	.07⅛
Liquid, tks	lb.	...	.02⅞	...	.02⅞	...	.02⅞
Manure Salts, imported							
30% basis, blk	unit	...	.58½	.	.58½	.55	.58½
Potassium Abietate, bbls	lb.	...	.08	.08	.13	.	.
Acetate, tech, bbls, delv	lb.	...	.26	.26	.28	.26	.28
Bicarbonate, USP, 320 lb							
bbls	lb.	...	.18	...	.18	.09	.18
Bichromate Crystals, 725 lb							
cks*	lb.	.08¾	.09¼	.08¾	.09¼	.08¾	.09
Binoxalate, 300 lb bbls	lb.	.	.23	.	.23	.	.23
Bisulfate, 100 lb kgs	lb.	.15½	.18	.15½	.18	.15½	.18
Carbonate, 80-85% calc 800							
lb cks	lb.	.06½	.07	.06½	.07	.06½	.07
liquid, tks	lb.	.	.02⅞	.	.02⅞	.02¼	.02⅞
drs, wks	lb.	.03	.03½	.03	.03½	.02⅞	.03½
Chlorate crys, 112 lb kgs,							
wks	lb.	.09¼	.09½	.09¼	.09½	.09¼	.09½
gran, kgs	lb.	.12	.13	.12	.13	.12	.13
powd, kgs	lb.	.08½	.08¾	.08½	.08¾	.08½	.08¾
Chloride, crys, bbls	lb.	.04	.04¾	.04	.04¾	.04	.04¾
Chromate, kgs	lb.	.19	.28	.19	.28	.28	.29
Cyanide, 110 lb cases	lb	.50	.55	.50	.57½	.55	.57½
Iodide, 250 lb bbls	lb.	...	1.13	.93	1.13	.93	1.15
Metabisulfite, 300 lb bbls	lb.	.12	.13½	.12	.15	.11	.15
Muriate, bgs, dom, blk	unit		.53½	.	.53½	.50	.53½
Oxalate, bbls	lb.	.25	.26	.25	.26	.25	.26
Perchlorate, kgs, wks	lb.	.09	.10½	.09	.11½	.09½	.11
Permanganate, USP, crys,							
500 & 1000 lb drs, wks	lb.	.18½	.19½	.18½	.19½	.18½	.19½
Prussiate, red, bbls	lb.	.30½	.34	.30½	.37	.35	.37
Yellow, bbls	lb.	.15	.16	.15	.16	.15	.18
Sulfate, 90% basis, bgs	ton	.	38.00	.	38.00	...	36.25
Titanium Oxalate, 200 lb							
bbls	lb.	.35	.40	.35	.40	.33	.40
Pot & Mag Sulfate, 48% basis							
bgs	ton		25.75	.	25.75	24.75	25.75
Propane, group 3, tks	lb.	.03	.04⅜	.03	.04⅜	.03	.04⅜
Putty, coml, tubs	100 lb.	.	3.00	2.25	3.00	2.90	3.00
Linseed Oil, kgs	100 lb.	.	4.50	4.00	4.65	4.65	4.75
Pyrethrum, conc liq:							
2.4% pyrethrins, drs, frt all'd	gal.	6.40	6.75	5.00	6.75	4.15	5.25
3.6% pyrethrins, drs, frt all'd	gal.	9.60	9.95	7.65	9.95	6.10	7.85
Flowers, coarse, Japan,							
bgs	lb.	.	.27	.18	.28½	.12¼	.18
Fine powd, bbls	lb.	.	.28	.19	.30	.14	.19
Pyridine, denat, 50 gal drs	gal.	...	1.53	1.53	1.55	1.30	1.55
Refined, drs	lb.	.	.45		.45		
Pyrites, Spanish cif Atlantic							
ports, blk	unit	.12	.13	.12	.13	.12	.13
Pyrocatechin, CP, drs, tins	lb.	2.15	2.75	2.15	2.75	2.15	2.75
Quebracho, 35% liq tks	lb.	....	.03⅛	.03	.03⅛	.02⅞	.03
450 lb bbls, c-l	lb.	....	.04⅛	.03½	.04⅛	.03½	.03⅞
Solid, 63%, 100 lb bales							
cif	lb	.	.04	.	.04	03⅞	.04
Clarified, 64%, bales	lb.	.	.04¼	.	.04¼	04¼	.04⅜
Quercitron, 51 deg liq, 450 lb							
bbls	lb.	.07½	.08½	.06	.08½	.06	.06½
Solid, drs	lb.	10	.12	.10	.12	.10	.12

R SALT

R Salt, 250 lb bbls, wks	lb.	.52	.55	.52	.55	.52	.55
Resorcinol tech, cans	lb.	.75	.80	.75	.80	.75	.80
Rochelle Salt, cryst	lb.	.17¾	.18¼	.15	.18¼	.14½	.15½
Powd, bbls	lb.	.16¾	.17¼	.16	.18½	.13½	.16½
Rosin Oil, bbls, first run	gal.	.45	.47	.45	.60	.52	.73
Second run	gal.	.47	.49	.47	.62	.54	.75
Third run, drs	gal.	.51	53	51	.66	.58	.79

* Spot price is ½c higher.

Specify



THREE ELEPHANT
BORAX-BORIC ACID

POTASH TRONA SALTS
MURIATE OF POTASH
Stocks carried in principal cities of United States and Canada

AMERICAN POTASH & CHEMICAL CORP.
70 PINE STREET NEW YORK

TECHNICAL U.S.P.
RESORCIN
C. P.
CATECHOL
Resublimed Crystals
WRITE for PRICES
PENNSYLVANIA COAL PRODUCTS CO.
Est. 1916 PETROLIA, PA.

TARTARS
TARTARIC ACID
ROCHELLE SALT
CREAM TARTAR
Murray Hill 6-1990
441 LEXINGTON AVE NEW YORK
Wm. NEUBERG Inc.

In the particular phase of the chemical industry which has been our life work for more than forty years, we have available a wide experience and knowledge that may be of great value to you. We invite inquiries pertinent to the chemicals we manufacture and their uses.

Oldbury
Electro-Chemical
Company

Plant and Main Office:
Niagara Falls, New York

New York Office: 22 E. 40th St., New York City

Phosphorus and phosphorus products. Sodium chlorate. Potassium perchlorate. Oxalic acid

Glycocoll
(AMINO ACETIC ACID)
USES: Medicinal in Tonics - Buffer - Mfr. of Dyes - Synthetic - Antioxidant - Dyeing Assistant - Preservative - Addition Agent.

CAPRYL ALCOHOL
ACETAMIDE
CHLOR-PARAFFINS

AMECCO CHEMICALS, INC.
(Formerly American Chemical Products Co.)
75 Rockwood St. Rochester, N. Y.

AMECCO CHEMICALS

CRUDE SULPHUR
99½% PURE
Free From
ARSENIC, SELENIUM AND TELLURIUM
•
TEXAS GULF SULPHUR COMPANY
(INCORPORATED)
75 East 45th St., New York City
Deposits and Plants: Newgulf and Long Point, Texas

Prices

Rosins
Sodium Naphthionate

	Current Market	1938 Low	1938 High	1937 Low	1937 High
Rosins 600 lb bbls, 280 lb unit ex. yard NY:					
B	...	4.90	4.65	6.00	5.50	10.00
D	...	5.20	4.90	6.00	5.50	10.35
E	...	5.30	4.95	6.00	5.75	10.25
F	...	6.35	5.30	7.00	6.87½	10.80
G	...	6.35	5.50	7.05	6.87½	10.85
H	...	6.35	5.55	7.15	6.90	10.85
I	...	6.35	5.60	7.15	6.95	10.90
K	...	6.35	5.65	7.25	6.95	10.90
M	...	6.35	5.65	7.40	7.05	11.00
N	...	6.85	6.20	7.50	7.10	11.05
WG	...	6.90	6.80	8.45	7.65	11.75
WW	...	7.50	7.70	9.15	8.00	13.75
Rosins, Gum, Savannah (280 lb unit):						
B	...	3.50	3.25	4.60	4.25	8.75
D	...	3.80	3.50	4.60	4.25	9.00
E	...	3.90	3.55	4.60	4.25	9.10
F	...	4.95	3.90	5.60	5.50	9.55
G	...	4.95	4.10	5.65	5.60	9.60
H	...	4.95	4.20	5.75	5.70	9.60
I	...	4.95	4.20	5.85	5.70	9.65
K	...	4.95	4.20	6.00	5.70	9.65
M	...	4.95	4.20	6.15	5.80	9.75
N	...	5.45	4.80	6.20	5.85	9.75
WG	...	5.60	5.40	7.05	6.40	10.50
WW	...	6.10	6.10	7.75	6.75	12.50
X	...	6.10	6.10	7.75	6.75	12.50
Rosin, Wood, c-l, FF grade, NY	5.35	6.05	5.05	6.40	6.40	10.72
Rotten Stone, bgs mines ..ton	...	35.00	...	35.00	...	35.00
Imported, lump, bbls ...lb.	...	.12	...	.12	...	...
Powdered, bbls .....lb.	.08½	.10	.08½	.10	...	...

SAGO FLOUR

Sago Flour, 150 lb bgs ...lb.	.02½	.03½	.02½	.03¾	.02¾	.03¾
Sal Soda, bbls, wks ...100 lb.	...	1.20	...	1.20	1.15	1.20
Salt Cake, 94-96%, c-l, wks ton	19.00	23.00	19.00	23.00	19.00	23.00
Chrome, c-l, wks .....ton	11.00	12.00	11.00	12.00	11.00	12.00
Saltpetre, gran, 450-500 lb bbls .....lb.	.06½	.069	.06½	.069	.06	.069
Cryst, bbls .....lb.	.07½	.0865	.07½	.0865	.07	.0865
Powd, bbls .....lb.	.07½	.079	.07½	.079	.07	.079
Satin, White, pulp, 550 lb bbls .....lb.	.01¼	.01½	.01¼	.01½	.01¼	.01½
Schaeffer's Salt, kgs .....lb.	.46	.48	.46	.48	.46	.48
Shellac, Bone dry, bbls..lb. *r*	.19	.20	.16½	.20	.17	.22
Garnet, bgs .....lb.	.12½	.13	.12½	.15	.14	.17
Superfine, bgs .....lb. *s*	.11½	.12	.11½	.13½	.13	.18½
T. N., bgs .....lb. *s*	.11	.11½	.11	.12½	.12	.14½
Silver Nitrate, vials .....oz.	.31½	.33½	.33½	.34⅜	.32⅝	.35½
Slate Flour, bgs, wks ....ton	9.00	10.00	9.00	10.00	9.00	10.00
Soda Ash, 58% dense, bgs, c-l, wks .....100 lb.	...	1.10	...	1.10	...	1.10
58% light, bgs .....100 lb.	...	1.08	...	1.08	...	1.08
blk .....100 lb.	...	.90	...	.90	...	.90
paper bgs .....100 lb.	...	1.05	...	1.05	...	1.05
bbls .....100 lb.	...	1.35	...	1.35	...	1.35
Caustic, 76% grnd & flake, drs .....100 lb.	...	2.70	...	2.70	...	2.70
76% solid, drs .....100 lb.	...	2.30	...	2.30	...	2.30
Liquid sellers, tks ..100 lb.	...	1.97½	...	1.97½	...	1.97½
Sodium Abietate, drs .....lb.	...	.10	.10	.13	.08	.13
Acetate, 60% tech, gran, powd, flake, 450 lb bbls, wks .....lb.	.04	.05	.04	.05	.04¼	.05
anhyd, drs, delv .....lb.	...	.08¼	...	.08¼	...	...
Alignate, drs .....lb.	...	.69	...	.69	.64	.69
Antimoniate, bbls .....lb.	.12	.12½	.12	.15¼	.13¾	.16¼
Arsenate, drs .....lb.	.08	.08½	.08	.08½	.08	.11½
Arsenite, liq, drs .....gal.	.30	.33	.30	.33	.33	.40
Dry, gray, drs, wks ..lb.	.07½	.09½	.07½	.09½	...	...
Benzoate, USP, kgs ...lb.	.46	.48	.46	.48	.46	.48
Bicarb, powd, 400 lb bbl, wks .....100 lb.	...	1.85	...	1.85	1.75	1.85
Bichromate, 500 lb cks, wks* .....lb.	.06¾	.07¼	.06¾	.07¼	.06½	.07¼
Bisulfite, 500 lb bbl, wks lb.	.03¼	.036	.03¼	.036	.03¼	.036
35-40% sol bbls, wks 100 lb.	1.40	1.80	1.40	1.80	...	...
Chlorate, bgs, wks ...lb.	.06¼	.07½	.06¼	.07½	.06¼	.07½
Cyanide, 96-98%, 100 & 250 lb drs, wks .....lb.	.14	.15	.14	.17½	.15½	.17½
Diacetate, 33-35% acid, bbls, lcl, delv .....lb.	...	.09	...	.09	...	...
Fluoride, white 90%, 300 lb bbls, wks .....lb.	.07½	.08¼	.07½	.08¼	.07½	.08¼
Hydrosulfite, 200 lb bbls, f.o.b. wks .....lb.	.16	.17	.16	.17	.16	.17
Hyposulfite, tech, pea crys 375 lb bbls, wks 100 lb.	...	2.80	2.50	2.80	2.50	3.00
Tech, reg cryst, 375 lb bbls, wks .....100 lb.	2.45	2.80	2.40	2.80	2.40	2.75
Iodide, jars .....lb.	...	2.10	1.90	2.10	1.90	1.95
Metal, drs, 280 lbs. .....lb.	...	.19	...	.19	...	.19
Metanilate, 150 lb bbls lb.	.41	.42	.41	.42	.41	.42
Metasilicate, gran, c-l, wks .....100 lb.	...	2.20	2.15	2.20	...	2.15
cryst, drs, c-l, wks 100 lb.	...	2.90	2.75	2.90	...	2.75
Monohydrate, bbls .....lb.	...	.023	...	.023	...	.023
Naphthenate, drs .....lb.	.12	.19	.12	.19	.09	.19
Naphthionate, 300 lb bbl lb.	.52	.54	.52	.54	.52	.54

r Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 2c; Philadelphia deliveries f.o.b. N. Y.; refined 6c higher in each case; *s* T. N and Superfine prices quoted f.o.b. N. Y. and Boston; Chicago prices 1c higher; Pacific Coast 3c; Philadelphia f.o.b. N. Y. * Spot price is ⅛c higher.

	Current Market	1938 Low	1938 High	1937 Low	1937 High
Sodium (continued):					
Nitrate, 92%, crude, 200 lb bgs, c-l, NY ton	... 28.30	... 28.30	26.80	28.30	
100 lb bgs ton	... 29.00	... 29.00	27.50	29.00	
Bulk ton	... 27.00	... 27.00	25.50	27.00	
Nitrite, 500 lb bbls lb.	.06¾ .11½	.06¾ .11½	.07	.10	
Orthochlorotoluene, sulfonate, 175 lb bbls, wks lb.	.25 .27	.25 .27	.25	.27	
Perborate, drs, 400 lbs lb.	.14¾ .15¼	.14¾ .15¼	.14¾	.15¼	
Peroxide, bbls, 400 lb lb.	... .17	... .17	...	.17	
Phosphate, di-sodium, tech, 310 lb bbls, wks 100 lb.	... 2.05	... 2.05	1.90	2.05	
bgs, wks 100 lb.	... 1.85	... 1.85	1.70	1.85	
Tri-sodium, tech, 325 lb bbls, wks 100 lb.	... 2.20	... 2.20	2.05	2.20	
bgs, wks 100 lb.	... 2.00	... 2.00	1.85	2.00	
Picramate, 160 lb kgs lb.	.65 .67	.65 .67	.65	.67	
Prussiate, Yellow, 350 lb bbl. wks lb.	.09½ .10	.09 .11½	.10	.11½	
Pyrophosphate, anhyd, 100 lb bbls fob wks frt eq lb.	... .0610	.0610 .10	...	.10	
Sesquisilicate, drs, c-l, wks 100 lb.	... 2.80	2.80 3.00	...	...	
Silicate, 60°, 55 gal drs, wks 100 lb.	1.65 1.70	1.65 1.70	1.65	1.70	
40°, 55 gal drs, wks 100 lb.	... .80	... .80	...	.80	
tks, wks 100 lb.	... .65	... .65	...	.65	
Silicofluoride, 450 lb bbls NY lb.	.05¼ .05½	.05¼ .06½	.05¾	.07	
Stannate, 100 lb drs lb.	.30 .33	.25½ .33	.28	.44	
Stearate, bbls lb.	.19 .24	.19 .24	.19	.24	
Sulfanilate, 400 lb bbls lb.	.16 .18	.16 .18	.16	.18	
Sulfate Anhyd, 550 lb bgs* c-l, wks 100 lb. †	1.45 1.90	1.45 1.90	1.45	1.90	
Sulfide, 80% cryst, 440 lb bbls, wks lb.	... .02¼	... .02¼	...	.02¼	
Solid, 650 lb drs, c-l, wks lb.	... .03	... .03	...	.02	
Sulfite, cryst, 400 lb bbls, wks lb.	.023 .02½	.023 .02½	.023	.02½	
Sulfocyanide, drs lb.	.28 .47	.28 .47	.28	.47	
Sulforicinoleate, bbls lb.	.12	.12		.12	
Tungstate, tech, crys, kgs lb.	1.05 1.10	1.05 1.35	.85	.90	
Sorbitol, com, solut., wks, c-l drs, wks lb.	... .17	.17 .19	...	.25	
Spruce Extract, ord, tks lb.	... .01⅛	... .01⅛	.01	.01⅛	
Ordinary, bbls lb.	... .01⅝	... .01⅝	.01½	.01⅝	
Super spruce ext, tks lb.	... .01⅛	... .01⅛	.01⅛	.01⅝	
Super spruce ext, bbls lb.	... .01⅞	... .01⅞	...	.01⅞	
Super spruce ext, powd, bgs lb.	... .04	... .04	.04	.04¼	
Starch, Pearl, 140 lb bgs 100 lb.	2.50 2.70	2.45 3.18	2.93	4.53	
Powd, 140 lb bgs 100 lb.	2.60 2.80	2.55 3.28	3.03	4.63	
Potato, 200 lb bgs lb.	.04 .05	.03½ .05½	.04½	.05½	
Imp, bgs lb.	.05 .06	.05 .06	.05	.06	
Rice, 200 lb bbls lb.	.06¼ .07¼	.06¼ .07¼	...	.07¼	
Wheat, thick, bgs lb.	.06¼ nom.	.06¼ .07	.07	.08½	
Strontium carbonate, 600 lb bbls, wks lb.	.07¼ .07½	.07¼ .07½	.07½	.07¼	.07½
Nitrate, 600 lb bbls, NY lb.	.07¾ .08¼	.07¾ .09¼	.07¾	.08¾	
Sucrose octa-acetate, den, grd, bbls, wks lb.	... .45	... .45	...	.45	
tech, bbls, wks lb.	... .40	... .40	...	.40	
Sulfur, crude, f.o.b. mines ton	... 16.00	16.00 19.00	18.00	19.00	
Flour, coml, bgs 100 lb.	1.65 2.35	1.65 2.35	1.65	2.35	
bbls 100 lb.	1.95 2.70	1.95 2.70	1.95	2.70	
Rubbermakers, bgs 100 lb.	2.20 2.80	2.20 2.80	2.20	2.80	
bbls 100 lb.	2.55 3.15	2.55 3.15	2.55	3.15	
Extra fine, bgs 100 lb.	2.85 3.00	2.85 3.00	2.85	3.00	
Superfine, bgs 100 lb.	2.65 2.80	2.65 2.80	2.65	2.80	
bbls 100 lb.	2.25 3.10	2.25 3.10	2.25	3.10	
Flowers, bgs 100 lb.	3.00 3.75	3.00 3.75	3.00	3.75	
bbls 100 lb.	3.35 4.10	3.35 4.10	3.35	4.10	
Roll, bgs 100 lb.	2.35 3.10	2.35 3.10	2.35	3.10	
bbls 100 lb.	2.50 3.25	2.50 3.25	2.50	3.25	
Sulfur Chloride, 700 lb drs, wks lb.	.03 .04	.03 .04	.02½	.04	
Sulfur Dioxide, 150 lb cyl lb.	.07 .09	.07 .09	.07	.09	
Multiple units, wks lb.	.04½ .07	.04½ .07	.04½	.07	
tks, wks lb.	.04 .05	.04 .05	.04	.05	
Refrigeration, cyl, wks lb.	.16 .17	.16 .17	.15	.17	
Multiple units, wks lb.	.07½ .10	.07½ .10	.07½	.10	
Sulfuryl Chloride lb.	.15 .40	.15 .40	.15	.40	
Sumac, Italian, grd ton	... 68.00	62.00 68.00	58.50	65.00	
Extract, 42°, bbls lb.	.05¼ .06¼	.05¼ .06¼	.05¼	.06¼	
Superphosphate, 16% bulk, wks ton	... 8.00	8.00 9.00	8.25	9.00	
Run of pile ton	... 7.50	7.50 8.50	8.00	8.50	
Triple, 40-48%, a.p.a. bulk, wks, Balt. unit ton	... .70	.70 .85	.70	.85	
Talc, Crude, 100 lb bgs, NY ton	13.00 15.00	13.00 15.00	13.00	15.00	
Ref'd, 100 lb bgs, NY ton	14.00 16.00	14.00 16.00	14.00	16.00	
French, 220 lb bgs, NY ton	23.00 30.00	23.00 30.00	23.00	30.00	
Ref'd, white, bgs, NY ton	45.00 60 00	45.00 60.00	45.00	60.00	
Italian, 220 lb bgs to arr ton	60.00 62.00	60.00 62.00	60.00	62.00	
Ref'd, white, bgs, NY ton	65.00 70.00	65.00 70.00	65.00	70.00	
Tankage Grd, NY unit ‡	... 2.75	2.50 3.00	3.00	4.40	
Ungrd unit ‡	... 2.75	2.35 3.00	2.80	4.35	
Fert grade, f.o.b. Chgo unit ‡	... 2.65	2.25 2.65	2.75	4.00	
South American cif unit ‡	... 3.10	3.00 3.45	3.15	4.25	
Tapioca Flour, high grade, bgs lb.	.02 .05½	.02 .05½	.03¼	.05½	
Tar Acid Oil, 15%, drs gal.	.22 .25	.22 .25½	.21	.25½	
25%, drs gal.	.25½ .28½	.25½ .29½	.24½	.29½	
Tar, pine, delv, drs gal.	... .26	... .26	...	.26	
tks, delv, E. cities gal.	... .20	... .20	...	.20	
Tartar Emetic, tech, bbls lb.	.27¾ .28	.26¼ .28	.24¾	.27	
USP, bbls lb.	.33 .33½	.32 .33½	.30	.32½	

† Bags 15c lower; ‡ + 10; *Bbls. are 20c higher.

Ready to Serve

at all times—in all places everything for refrigeration

BOWER BRAND AMMONIA

ANHYDROUS • AQUA
CALCIUM CHLORIDE
CORROSION RETARDER

Write for descriptive literature

Est. 1858

HENRY BOWER CHEMICAL MANUFACTURING COMPANY
29th & GRAY'S FERRY ROAD
PHILADELPHIA, PA.

SULPHUR
CRUDE 99½% PURE

Free from arsenic, selenium and tellurium

WE... respectfully solicit your inquiries...

MINES—Clemens, Brazoria County, Texas.

For convenience of Buyers, we are now carrying stocks at Baltimore.

JEFFERSON LAKE OIL CO., INC.
SUITE 1406-9, WHITNEY BLDG., NEW ORLEANS, LA.

E. DeHaën's

FIXANAL

VOLUMETRIC SOLUTION

For Convenient and Rapid Testing

FIXANAL Preparations are accurately weighed, standardized, analytical chemicals, which, diluted according to directions, provide accurate volumetric solutions for instant use. Guaranteed accuracy within 2 parts per 1000. Special Normalities for testing Sugar, Oil and Fat, Blood and Urine, Milk, Iron and Steel, Benzol, etc.

Write for details

Pfaltz & Bauer, Inc.

EMPIRE STATE BUILDING, NEW YORK

THE

BROOKMIRE

ECONOMIC SERVICE

•

INVESTMENT *and* ECONOMIC COUNSELORS

•

Descriptive booklet of Brookmire Services and sample Bulletins on investment, business and economic subjects mailed upon request. Kindly address Department 40

BROOKMIRE

Corporation—*Investment Counselors and Administrative Economists*—Founded 1904

551 Fifth Avenue, New York

Prices—Current

Terpineol Zinc Dust

		Current Market	1938 Low	1938 High	1937 Low	1937 High
Terpineol, den grade, drs	lb.	...	.17	...	.17	.13¾ .14¼
Tetrachlorethane, 650 lb drs	lb.	.08	.08½	.08	.08½	.08 .08½
Tetrachloroethylene, drs, tech	lb.	...	.09½	...	.09½	... .10½
Tetralene, 50 gal drs, wks	lb.	.12	.13	.12	.13	.12 .13
Thiocarbanilid, 170 lb bbls	lb.	.20	.25	.20	.25	.20 .25
Tin, crystals, 500 lb bbls, wks	lb.	.35	.35½	.31	.35½	.33 .46
Metal, NY	lb.	...	.44½	.3570	.44½	.41 .66
Oxide, 300 lb bbls, wks	lb.	.48	.50	.44	.50	.48 .62
Tetrachloride, 100 lb drs, wks	lb.	...	.22½	.18½	.22½	.21 .32
Titanium Dioxide, 300 lb bbls	lb.	.15¼	.16	.15¼	.17	.16¼ .17
Barium Pigment, bbls	lb.	.05⅝	.05⅞	.05⅝	.06⅜	.06 .06⅜
Calcium Pigment, bbls	lb.	.05⅝	.05⅞	.05⅝	.06⅜	.06 .06⅜
Toluidine, mixed, 900 lb drs, wks	lb.	.26	.27	.26	.27	.26 .27
Toluol, 110 gal drs, wks	gal.	...	.27	.27	.35	... .35
8000 gal tks, frt all'd	gal.	...	.22	.22	.30	... .30
Toner Lithol, red, bbls	lb.	.75	.80	.75	.80	.75 .80
Para, red, bbls	lb.	.75	.80	.75	.80	... .75
Toluidine, bgs	lb.	...	1.35	...	1.35	... 1.35
Triacetin, 50 gal drs, wks	lb.	...	.36	...	.36	... .36
Triamyl Borate, lcl, drs, wks	lb.	...	.27	...	.27	... .27
Triamylamine, c-l, drs, wks	lb.	.77	1.25	.77	1.25	.77 1.25
Tributylamine, lcl, drs, wks	lb.	...	.70	...	.70	... .
Tributyl citrate, drs, frt all'd	lb.	...	.45	.	.45	... .45
Tributyl Phosphate, frt all'd	lb.	...	.42	.42	.50	... .50
Trichlorethylene, 600 lb drs, frt all'd E. Rocky Mts	lb.	.09	.09½	.089	.09½	.089 .094
Tricresyl phosphate, tech, drs	lb.	.24½	.39	.24½	.39	.22½ .26½
Triethanolamine, 50 gal drs wks	lb.	.21	.22	.21	.22	.21 .30
tks, wks	lb.	...	.20	...	.20	.20 .25
Triethylene glycol, drs, wks	lb.	...	.26	...	.26	... .
Trihydroxyethylamine Oleate, bbls	lb.	...	.30	...	.30	... ...
Stearate, bbls	lb.	...	.30	...	.30	... ...
Trimethyl Phosphate, drs, lcl fob dest	lb.	...	.50	...	.50	... ...
Trimethylamine, c-l, drs, frt all'd E. Mississippi	lb.	...	1.00	...	1.00	... 1.00
Triphenylguanidine	lb.	.58	.60	.58	.60	.58 .60
Triphenyl Phosphate, drs	lb.	...	.38	.34	.38	... ...
Tripoli, airfloated, bgs, wks	ton	26.00	30.00	26.00	30.00	25.00 30.00
Turpentine (Spirits), c-l, NY dock, bbls	gal.	...	.26½	.26¼	.31½	.31 .47
Savannah, bbls	gal.	...	20½	.20½	.30¾	.25 .42
Jacksonville, bbls	gal.	...	.20½	.20½	.30¾	.25 .41
Wood Steam dist, bbls, c-l, NY	gal.	...	.27	.27	.31	.30 .44
Wood, dest dist, c-l, drs, delv E. cities	gal.	.22	.24	.22	.36	... ...
Urea, pure, 112 lb cases	lb.	.14½	.15½	.14½	.15½	.14½ .15½
Fert grade, bgs, c.i.f.	ton	...	...	...	...	... ...
c.i.f. S.A. points	ton	95.00	110.00	95.00	110.00	95.00 110.00
Dom, f.o.b., wks	ton	95.00	101.00	95.00	101.00	95.00 101.00
Urea Ammonia liq 55% NH_3, tks	unit	...	1.00	1.00	1.04	1.00 1.04
Valonia beard, 42%, tannin bgs	ton	...	48.00	45.00	52.00	35.00 52.00
Cups, 32% tannin, bgs	ton	30.00	34.00	30.00	37.50	31.50 36.00
Extract, powd, 63%	lb.	...	.06	...	.06	... ...
Vanillin, ex eugenol, 25 lb tins, 2000 lb lots	lb.	...	2.10	2.10	3.10	3.10 3.65
Ex-guaiacol	lb.	...	2.00	2.00	3.00	3.00 3.55
Ex-lignin	lb.	...	2.00	2.00	2.25	... ...
Vermilion, English, kgs	lb.	1.45	1.59	1.45	1.69	1.60 1.90
Wattle Bark, bgs	ton	39.00	41.00	39.00	41.75	31.00 43.75
Extract, 60°, tks, bbls	lb.	...	.04⅜	.04⅜	.04⅝	.03⅝ .04⅝

WAXES

Wax, Bayberry, bgs	lb.	.16⅞	.17	.16⅞	.17	.16½	.17½
Bees, bleached, white 500 lb slabs, cases	lb.	.37	.39	.35	.45	.38	.45
Yellow, African, bgs	lb.	.20½	.21	.20½	.26	.25	.30
Brazilian, bgs	lb.	.22	.23	.22	.29	.27	.34
Chilean, bgs	lb.	.22	.23	.22	.29	.27	.34
Refined, 500 lb slabs, cases	lb.	.32½	.33	.32	.39	.29½	.39
Candelilla, bgs	lb.	.15	.16	.13½	.16	.13	.16½
Carnauba, No. 1, yellow, bgs	lb.	.42½	.44	.38	.44	.42	.49
No. 2, yellow, bgs	lb.	.41½	.42	.36	.42	.41	.46½
No. 2, N. C., bgs	lb.	.37	.37½	.35½	.40	.38	.43
No. 3, Chalky, bgs	lb.	.33½	.35½	.31½	.35½	.33	.40
No. 3, N. C., bgs	lb.	.33½	.35½	.31½	.35½	.34	.43
Ceresin, dom, bgs	lb.	.08½	.11½	.08½	.11½	.08	.12
Japan, 224 lb cases	lb.	.10¾	.11	.09¼	.11	.09½	.11¼
Montan, crude, bgs	lb.	.11⅜	.12⅛	.11	.12⅛	.11	.12
Paraffin, see Paraffin Wax.							
Spermaceti, blocks, cases	lb.	.22	.23	.22	.24	.23	.24
Cakes, cases	lb.	.23	.24	.23	.25	.24	.25
Whiting, chalk, com, 200 lb bgs c-l, wks	ton	12.00	14.00	12.00	14.00	12.00	14.00
Gilders, bgs, c-l, wks	ton	...	15.00	...	15.00	...	15.00
Wood Flour, c-l, bgs	ton	20.00	33.00	20.00	33.00	18.00	30.00
Xylol, frt allowed, East 10° tks, wks	gal.	...	.29	.29	.33	...	.33
Coml, tks, wks, frt all'd	gal.	...	.26	.26	.30	...	.30
Xylidine, mixed crude, drs	lb.	.35	.36	.35	.36	.35	.36
Zinc Acetate, tech, bbls, lcl, delv	lb.	...	.21	...	.21	...	...
Arsenate, bgs, frt all'd	lb.	.12½	.13	.12½	.13½	...	...
Arsenite, bgs, frt all'd	lb.	.12½	.13	.12½	.13	...	...
Carbonate tech, bbls, NY	lb.	.14	.15	.14	.15	.12	.15
Chloride fused, 600 lb drs, wks	lb.	.04¼	.046	.04¼	.046	.04½	.046
Gran, 500 lb drs, wks	lb.	.05	.05¼	.05	.05¼	.05	.05¼
Soln 50%, tks, wks 100 lb.		..	2.25	.	2.25	2.00	2.25
Cyanide, 100 lb drs	lb.	...	.33	.33	.38	.36	.38
Dust, 500 lb bbls, c-l, delv	lb.	...	.0695	.06	.0740	.0740	.094

FOR QUALITY AND SERVICE

Hooker Caustic Soda

A dependable source of supply, plus outstanding service and technical co-operation. Hooker technicians and the complete Hooker research laboratories are always at the service of customers.

HOOKER ELECTROCHEMICAL COMPANY

Eastern Sales Offices: Lincoln Bldg., New York City. Works, Niagara Falls, N. Y.
Western Sales Offices: Tacoma, Wash. Works, Tacoma, Wash.

OTHER HOOKER CHEMICALS

LIQUID CHLORINE · BLEACHING POWDER · MURIATIC ACID AND SOLVENTS
INSECTICIDES · DYE, PHARMACEUTICAL AND PERFUME INTERMEDIATES.

COBALT COMPOUNDS - HARSHAW

Pure, uniform chemicals, developed through thirty-seven years of research and production.

Order your requirements today.

Cobalt Acetate
Cobalt Ammonium Sulphate
Cobalt Carbonate
Cobalt Chloride
Cobalt Colors
Cobalt Hydrate
Cobalt Linoleate
Cobalt Naphthenate
Cobalt Nitrate
Cobalt Oxide
Cobalt Special Oxides
Cobalt Paste Driers
Cobalt Phosphate
Cobalt Resinate
Cobalt Sulphate

THE HARSHAW CHEMICAL CO.

Manufacturers, Importers, Merchants
Offices and Laboratories: Cleveland, Ohio

Quality products since 1892

New York, Philadelphia, Chicago, Detroit, Pittsburgh, Cincinnati, East Liverpool, Los Angeles, San Francisco

Works at Cleveland and Elyria, Ohio, and Philadelphia, Pa.

YELKIN "T"

THE STANDARDIZED LECITHIN

A NATURAL FAT SOLUBLE WETTING AGENT

Suggested for:

1: Complete wetting of paint pigments by vehicle.

2: Dispersing pigments in rubber.

3: Increasing wetting properties of textile finishing oils.

Also an efficient natural anti-oxidant.

Now available in standardized grades for technical use on a commercial price basis.

Grade "T"—Dark Brown
Grade "S"—Light Brown
Grade "D"—Golden

Samples for experiments furnished without charge if requested on your business stationery.

ROSS & ROWE, INC.
SPECIALIZING IN COLLOIDAL PRODUCTS
75 VARICK STREET, NEW YORK — WRIGLEY BLDG., CHICAGO

BEACON

ZINC STEARATE
BARIUM "
CALCIUM "
ALUMINUM "
MAGNESIUM "

For ALL INDUSTRIES

ZINC LAURATE *for Rubber Manufacturers*

THE BEACON COMPANY
89 Bickford Street — Boston, Mass.
Send for our booklet "Protective Colloids and Emulsions"

ESTABLISHED 1901
JOHN F. ABERNETHY & CO.
Incorporated,
Chemical Lead Burning Contractors
LEAD LINED TANKS
Specialists in Chemical Lead Burning, and Experienced in design of Chemical Equipment made of lead. Our products cover practically everything in Chemical line where Lead or Block Tin is used.
708-10 MYRTLE AVE., BROOKLYN, N.Y.

Prices—Current

Zinc Metal
Oil, Whale

	Current Market		1938 Low	1938 High	1937 Low	1937 High
Zinc (continued):						
Metal, high grade slabs, c-l, NY 100 lb.	...	5.35	4.35	5.35	5.35	7.85
E. St. Louis 100 lb.	...	4.95	4.00	5.00	5.00	7.50
Oxide, Amer, bgs, wks lb.	.06¼	.07½	.06	.07½	.05¼	.07¾
French 300 lb bbls, wks lb.	.06½	.07¾	.06¼	.07¾	.05½	.07¾
Palmitate, bbls lb.	.23	.25	.23	.25	.23	.25
Resinate, fused, pale, bbls lb.	...	.10	...	.10	.09	.10
Stearate, 50 lb bbls lb.	.20	.23	.20	.23	.20	.23
Zinc Sulfate, crys, 400 lb bbl, wks lb.	...	.029	.029	.033	.028	.033
Flake, bbls lb.	...	.0325	.0325	.0375	.032	.0375
Sulfide, 500 lb bbls, delv lb.	.08⅝	.08⅞	.08⅝	.09¾	.09¼	.09¾
bgs, delv lb.	.08⅜	.08⅝	.08⅜	.09	.09	.09½
Sulfocarbolate, 100 lb kgs lb.	.24	.26	.24	.26	.24	.26
Zirconium Oxide, crude, 73-75% grd, bbls, wks ton	75.00	100.00	75.00	100.00	...	...
kgs, wks lb.	.04¼	.04½	.04¼	.04½	...	...

Oils and Fats

Babassu, tks, futures lb.	...	.06⅜	.06¼	.06¾	.06¾	.11¼
Castor, No. 3, 400 lb bbls. lb.	.09¼	.10	.09¼	.10¾	.10¼	.10¾
Blown, 400 lb bbls lb.	.11¼	.12	.11¼	.13	.12¼	.13
China Wood, drs, spot NY lb.	.12½	.12¾	.10¼	.15¼	.12½	.23
Tks, spot NY lb.	.118	.12	.095	.15½	.118	.23
Coconut, edible, bbls NY lb.	...	.09	.09	.09½	.09½	.15
Manila, tks, NY lb.	...	.03⅜	.03⅜	.04¼	.04	.09½
Tks, Pacific Coast lb.	...	.03	.02⅞	.03¾	.03¾	.08⅞
Cod, Newfoundland, 50 gal bbls gal.	.38	nom.	.38	.52	.51	.52
Copra, bgs, NY lb.	...	.0195	.0185	.0235	.0235	.055
Corn, crude, tks, mills lb.	.07	.07¼	.06⅝	.08¼	.06½	.10¾
Refd, 375 lb bbls, NY lb.	.09¾	.10	.09¼	.10½	.09	.13¼
Degras, American, 50 gal bbls. NY lb.	.07¾	.08¼	.07½	.08¼	.07½	.08¼
English, bbls, NY lb.	.07¾	.08¼	.07½	.08¼	.07½	.08¼
Greases, Yellow lb.	.04¾	.05	.03½	.05½	.04½	.09
White, choice bbls, NY. lb.	.05⅝	.06	.05	.07	.06¾	.10¼
Lard Oil, edible, prime lb.	...	.11½	.11⅛	.12¾	.12¾	.16¾
Extra, bbls lb.	...	.09	.09	.10¾	.10¾	.13½
Extra, No. 1, bbls lb.	...	.08¾	.08¾	.09¾	.09¼	.13½
Linseed, Raw less than 5 bbl lots lb.	...	.097	.089	.115	.107	.121
bbls, c-l, spot lb.	...	.089	.081	.102	.099	.113
Tks lb.	...	.083	.07½	.096	.093	.107
Menhaden, tks, Baltimore gal.	.30	nom.	.34½	.37½	.34	.45
Refined, alkali, drs lb.	.067	.069	.067	.095	.08	.10
Tks lb.	...	.061	.061	.087	.074	.09
Kettle bodied, drs lb.	.076	.078	.076	.105	.09	.11
Light pressed, drs lb.	.061	.063	.061	.091	.074	.094
Tks lb.	...	.05½	05½	.08	.067	.084
Neatsfoot, CT, 20°, bbls, NY lb.	...	.15¼	.15¼	.17¼	.16¾	.18¼
Extra, bbls, NY lb.	...	.09	.09	.10	.09½	.13¾
Pure, bbls, NY lb.	...	.11¾	.11¾	.12¼	.11¾	.14¼
Oiticica, bbls lb.	.10½	.10¾	.09¼	.12¾	.10⅞	.17
Oleo, No. 1, bbls, NY lb.	...	.09½	.08½	.10½	.10½	.14½
No. 2, bbls, NY lb.	...	.09	.08	.10	.10	.14
Olive, denat, bbls, NY gal.	.94	.98	.88	1.20	1.15	1.65
Edible, bbls, NY gal.	1.75	2.00	1.75	2.35	2.20	2.50
Foots, bbls, NY lb.	.07	.07¼	.07	.09⅞	.09⅝	.12½
Palm, Kernel, bulk lb.	...	.0365	.0365	.04½	.04½	.08⅛
Niger, cks lb.	.07	.07¼	.07	.09⅞	.09⅝	.12½
Sumatra, tks lb.	...	.02¾	.02¾	.0375	.0375	.06½
Peanut, crude, bbls, NY lb.	...	.07¼	.07	.08¼	.06¼	.10⅝
Tks, f.o.b. mill lb.	.07⅛	.07¼	.06⅝	.08	.06½	.10¼
Refined, bbls, NY lb.	.10½	.10¾	.09¾	.10¾	.10	.13½
Perilla, drs, NY lb.	.09¾	.10	.09¾	.11¾	.11	.13½
Tks, Coast lb.	.09	.092	.09	.11	.105	.13
Pine, see Pine Oil, Chemical Section.						
Rapeseed, blown, bbls, NY lb.	.14	.14½	.14	.14¾	.13	.14¾
Denatured, drs, NY gal.	.75	.80	.75	.91	.85	.97
Red, Distilled, bbls lb.	...	.08¾	.08¾	.10⅝	.09⅝	.12⅝
Tks lb.	...	.07½	.07½	.09¾	.08¾	.10¾
Sardine, Pac Coast, tks gal.	...	.28	.28	.46½	.35	.55
Refined alkali, drs lb.	.067	.069	.067	.095	.08	.10
Tks lb.	...	.061	.061	.087	.074	.09
Light pressed, drs lb.	.061	.065	.061	.089	.074	.094
Tks lb.	...	.05½	.05½	.08	.067	.084
Sesame, yellow, dom lb.	...	.10½	.10¼	.10½	.10¼	.13¼
White, dom lb.	...	.10½	.10¼	.10½	.10¼	.13¼
Soy Bean, crude Dom, tks, f.o.b. mills lb.	...	.05⅞	.05⅞	.07	.06	.10½
Crude, drs, NY lb.	.06½	.07	.06½	.08	.066	.11½
Ref'd, drs, NY lb.	.07675	.0825	.07⅝	.097	.078	.12½
Tks lb.	...	.0685	.0685	.082	.072	.11½
Sperm, 38° CT, bleached, bbls NY lb.	.10	.102	.10	.102	.096	.102
45° CT, bleached, bbls, NY lb.	.093	.095	.093	.095	.089	.095
Stearic Acid, double pressed dist bgs lb.	.10½	.11	.10½	.12	.11	.13½
Double pressed saponified bgs lb.	.10¾	.11¾	.10¾	.12¼	.11¼	.13¾
Triple pressed dist bgs lb.	.13½	.14½	.13½	.15	.14	.16½
Stearine, Oleo, bbls lb.	.07¾	.08	.05½	.08½	.07	.11½
Tallow City, extra loose lb.	...	.05¼	.04¾	.06⅜	.05⅞	.09¼
Edible, tierces lb.	.07⅜	.07⅝	.06	.07⅝	.06⅞	.10¼
Acidless, tks, NY lb.	...	.08	.08	.09¼	.09	.13
Turkey Red, single, bbls lb.	.06¼	.08½	.06¼	.08½	.08	.08½
Double, bbls lb.	.09½	.11	.09½	.13	.12½	.13
Whale: Winter bleach, bbls, NY lb.	.081	.083	.081	.10	.091	.111
Refined, nat. bbls, NY lb	.077	.079	.077	.096	.087	.107

ADVERTISING PAGES REMOVED

Index to Advertisers

National Aniline & Chemical Co., Inc. .....Pages 376 and 386
Natural Products Refining Co. 364
Neuberg, Inc., William 443
Niacet Chemicals Corp. 433
Niagara Alkali Co. 426

Oldbury Electro-Chemical Co. 444

Pacific Coast Borax Co. 440
Paramet Chemical Corp. 438
Patterson Foundry & Machine Co. 451
Pennsylvania Coal Products Co. 443
Petrometer Corp. 451
Pfaltz & Bauer, Inc. 446
Pfizer, Chas. & Co., Inc. 424
Phelps Dodge Refining Corp. 440
Philadelphia Quartz Co. 420
Polachek, Z. H. 453
Prior Chemical Corp. 410
Puritan Compressed Gas Corp. 433

Reilly Tar & Chemical Corp. 422
Ross & Rowe, Inc. 448

Sharples Solvents Corp. 413
Slomon, Ira I. 453
Sobin Co., Inc., Irving M. 452
Solvay Sales Corporation .....Cover 2
Standard Silicate Division Diamond Alkali Co. 353
Starkie Co., A. E. 430
Starkweather Co., J. U. 452
Stauffer Chemical Co. 360
Stroock & Wittenberg Corp. 450

Tennessee Corp. 451
Texas Gulf Sulphur Co. 444
Textile Products Co. 452
Turner & Co., Joseph 439

Union Carbide & Carbon Corp. 361
U. S. Industrial Alcohol Co. .....Insert facing pages 400 and 401
U. S. Industrial Chemical Co. ....Insert facing pages 400 and 401
U. S. Phosphoric Products Corp. 451
U. S. Potash Co. 442

Victor Chemical Works 391

Warner Chemical Co. .....Pages 362 and 363
Wishnick-Tumpeer, Inc. .....Cover 4

HELIOGEN BLUE B POWDER

WITH COLORLESS PLASTICS PRODUCES BRILLIANT BLUES OF EXCELLENT LIGHT FASTNESS

GDC

GENERAL DYESTUFF CORPORATION

435 HUDSON STREET, NEW YORK, N. Y.

"We"—Editorially Speaking

Last month's issue of *Executives*, published by the Metropolitan Life Insurance Company, led off with the fascinating and profitable story of the growth of the diversification of the Koppers products by our own Charles J. Ramsburg, whose article on coal-tar appeared in our August number.

❖❖❖❖

Thanks to the Drug, Chemical and Allied Trades Section of the New York Board of Trade, we learn that there are 172 taxes paid on every bottle of milk of magnesia which almost persuades us that after all America should stick to castor oil—especially so since it is to be one of our great chemurgic crops.

❖❖❖❖

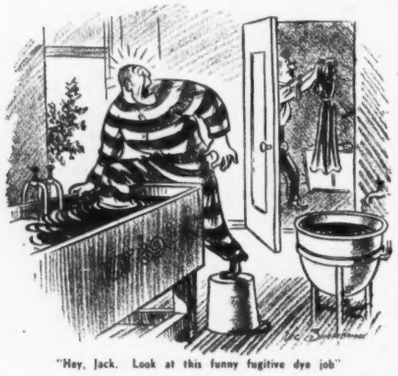
But joking aside, it is important indeed to throw all the light we can on the "hidden taxes" which are continually piling up, so that every time you buy a razor blade, you help pay 49 different tax bills, and in the price of a quart of milk there are tucked away 57 taxes. Pickles?—"We" will manfully resist that tempting wisecrack.

❖❖❖❖

One of the cleverest and most unusual bits of chemical publicity has been wrangled by the new firm of solvents distributors, Stoney-Mueller, Inc., out of the Lackawanna Railroad. It is a half page advertisement in the new Lackawanna folder, see page 12—and "We" are not charging for this "ad" either.

❖❖❖❖

Before "We" come to you again, you will receive your copy of the BUYER'S GUIDEBOOK NUMBER. Watch for it, and don't let the office boy make off with it, for there are three new sections that make it virtually a new book: buying guides of raw materials and of chemical specialties and a dictionary of over 18,000 chemical brands and trade names. "Look in the blue pages first!"



"Hey, Jack. Look at this funny fugitive dye job"

Courtesy, "National Cleaner & Dyer."

❖❖❖❖

There's no charge for this advertisement either.

❖❖❖❖

After reading the editorial leader in the September *Chem. & Met.*, "We" wonder if it would be contrary to S.E.C. regulations were somebody to subsidize Editor Kirkpatrick's permanent absence from New York since he, himself, confesses that whenever he leaves, chemical business in general and the stock market in particular pick up. Professionally, we're too biased to head the subscription list.

❖❖❖❖

On second thought, we've noticed the same thing about President Roosevelt's absences from Washington. But in this case our scruples are not in quite the same direction.

Fifteen Years Ago

From our issues of October, 1923

Thompson Munro Robins Chemical Co., St. Louis, changes name to Thompson, Hayward & Schleuter.

August Merz, new chairman, Dyestuffs Division, Synthetic Organic Chemical Mfrs. Ass'n.

Henry B. Faber and R. N. Shreve, chemical consultants, form partnership of Faber & Shreve, with offices in Chemists' Club Bldg.

George F. Baker elected president of Pennsylvania Salt Mfg. Co.; Leonard T. Beale becomes a director.

Chemists' Club celebrates 25th anniversary; A. A. Holmes (American Trona) chairman of committee in charge of entertainment.

Air Reduction has most prosperous year in its history, earning over $1,600,000.

Elmer H. Bobst, Hoffmann, La-Roche, recently returned from survey of chemical situation abroad, addresses Salesmen's Ass'n on "Chemical Conditions on the Continent."

WILLIAM H. RAND,
CHEMICAL INDUSTRY LEADER, HEADS ASSOCIATED INDUSTRIES OF MASS. NO "MONOPOLIST," HE WELCOMES NEW COMPANIES TO THE BAY STATE... ONCE HARVARD TRACK STAR AT THE OLYMPICS IN LONDON...
HIS AVOCATION: - DUCK HUNTING.
LOOK, AT THAT ARSENAL!

Courtesy, "Boston News Bureau."

Cleanliness is good chemical business, and you'll be surprised—at least "We" were—to learn that the laundry industry buys $22,000,000 worth of soaps, sours, and detergents, while the dry cleaners consume $30,000,000 worth of solvents.

❖❖❖❖

So, speaking of "chemicalization," as several of our readers write to us this month—see page 356—why shouldn't these two industries be classed among the chemical process industries? They employ over 350,000 people and pay out over 21 millions in salaries and wages.

❖❖❖❖

"We" hope it won't; but we fear this issue will come to your hand a day or two late. A flood, a hurricane, and a truckmen's strike can conspire very efficiently to upset a printing schedule.

❖❖❖❖

The Perkin Medal to Dr. Walter S. Landis is an award right in the royal line of chemists of distinguished industrial service. It is not to be forgotten that he was the technical pioneer of our first commercial nitrogen fixation and that he smelted phosphate rock 'way back before the War.

❖❖❖❖

A neat distinction between nations may be set up on the basis of whether the people are responsible to the Government or the Government responsible to the people.

❖❖❖❖

Press despatches from Hyde Park indicate that the President believes business would be right good if only businessmen would stop baiting the Administration. Well, at the very worst you must credit him with an original line of reasoning.

State of Chemical Trade

Current Statistics (September 30, 1938)—p. 19

WEEKLY STATISTICS OF BUSINESS

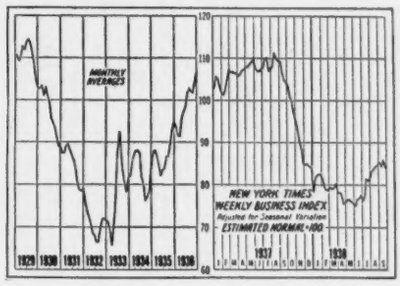
Week Ending	Carloadings 1938	Carloadings 1937	Carloadings % of Change	Electrical Output* 1938	Electrical Output* 1937	Electrical Output* % of Change	Jour. of Com. Price Index	Nat'l Fertilizer Ass'n Price Indices: Chem. & Drugs	Fats & Oils	Fert. Mat.	Mixed Fert.	All Groups	†Labor Dept. Chem. & Drug Price Index	% Steel Activity	N. Y. Times Index Bus. Act.	Fisher's Index Pur. Power
Aug. 20.....	597,918	777,145	—23.1	2,138,517	2,304,032	— 7.2	75.2	94.2	59.3	69.7	78.0	72.9	77.1	42.8	84.4	125.2
Aug. 27.....	620,511	782,476	—20.8	2,134,057	2,294,713	— 7.0	76.2	94.2	58.4	69.5	78.0	73.1	77.1	44.0	84.8	124.3
Sept. 3.....	648,039	801,539	—19.1	2,148,954	2,320,982	— 7.4	76.5	94.2	57.8	69.5	78.0	73.6	77.1	39.9	85.4	124.1
Sept. 10.....	568,887	708,202	—19.7	2,048,360	2,154,276	— 4 9	77.0	94.2	58.3	69.5	78.0	73.6	77.1	45.3	84.5	124.1
Sept. 17.....	660,142	822,795	—19.8	2,214,775	2,280,792	— 2 9	77.1	94.2	59.1	69.5	78.1	73.8	77.1	47.3	86.0	123.9
Sept. 24.....	675,533	836,865	—19.1	2,146,562	2,265,748	— 5.3	76.3	94.2	58.4	69.8	78.1	73.2	77.1	46.7	84.2	123.7

* K.W.H., 000 omitted; † Calendar year 1926 = 100.

MONTHLY STATISTICS

CHEMICAL:	August 1938	August 1937	July 1938	July 1937	June 1938	June 1937
Acid, sulfuric (expressed as 50° Baumé, short tons, Bureau of the Census)						
Total prod. by fert. mfrs.	.....	179,008	109,969	166,927	114,199	154,275
Consumpt. in mfr. fert.	.....	168,015	92,189	140,230	102,228	121,716
Stocks end of month	.....	67,167	88,392	75,583	83,289	76,052
Alcohol, Industrial (Bureau Internal Revenue)						
Ethyl alcohol prod., proof, gal.	17,284,176	17,067,262	16,370,040	18,253,750	16,395,184	18,657,582
Comp. denat. prod., wine gal.	1,502,022	1,813,306	1,303,324	1,027,067	2,492,965	878,226
Removed, wine gal.	1,444,159	1,780,507	1,268,542	926,013	2,437,777	814,063
Stocks end of mo., wine gal.	809,403	989,666	732,896	957,886	699,771	857,663
Spec. denat. prod., wine gal. ..	6,343,681	6,118,283	5,407,884	5,725,806	5,376,687	7,441,693
Removed, wine gal.	6,203,793	6,242,660	5,456,310	5,657,649	5,374,813	7,419,345
Stocks end of mo., wine gal.	606,897	733,920	437,548	864,396	491,850	799,468
Ammonia sulfate prod., tons *a*	34,898	72,499	30,482	69,204	27,967	64,093
Benzol prod., gals. *b*	5,585,000	11,144,000	4,769,000	10,762,000	4,413,000	9,517,000
Byproducts coke, prod., tons *a*	2,494,471	4,571,062	2,176,612	4,422,106	2,066,530	4,024,259
Cellulose Plastic Products (Bureau of the Census)						
Nitrocellulose sheets, prod., lbs.	.....	1,256,363	457,492	1,019,657	429,439	1,164,875
Sheets, ship., lbs.	.....	1,203,266	523,072	992,918	542,265	1,234,223
Rods, prod., lbs.	.....	300,663	142,715	193,791	145,197	292,784
Rods, ship., lbs.	.....	288,360	162,200	330,996	130,974	294,391
Tubes, prod., lbs.	.....	85,292	33,371	67,607	37,011	78,549
Tubes, ship., lbs.	.....	66,649	45,722	72,425	48,814	71,112
Cellulose acetate, sheets, rods, tubes						
Production, lbs.	.....	1,416,253	658,250	830,992	288,385	1,112,603
Shipments, lbs.	.....	1,466,693	601,724	887,938	323,356	1,042,937
Methanol (Bureau of the Census)						
Production, crude, gals.	.....	462,584	309,219	465,205	293,091	485,943
Production, synthetic, gals.	.....	2,735,963	1,449,607	2,564,783	1,629,570	2,263,507
Pyroxylin-Coated Textiles (Bureau of the Census)						
Light goods, ship., linear yds. ..	.....	2,778,419	.....	2,631,155	2,144,974	3,146,915
Heavy goods, ship., linear yds. .	.....	2,025,340	.....	1,489,980	1,289,869	1,870,658
Pyroxylin spreads, lbs. *c*	.....	5,981,611	.....	4,316,537	3,335,209	4,957,803
Exports (Bureau of Foreign & Dom. Commerce)						
Chemicals and related prod. *d*.	.....	.....	$9,700	$12,300	.....	.....
Crude sulfur d	.....	.....	$513	$1,192	$1,048	$1,002
Coal-tar chemicals *d*	.....	.....	$624	$1,146	$821	$1,336
Industrial chemicals *d*	.....	.....	$2,079	$2,459	$1,992	$2,449
Imports						
Chemicals and related prod. *d* ..	.....	.....	$4,800	$6,700	.....	.....
Coal-tar chemicals *d*	.....	.....	$1,555	$1,649	$887	$1,876
Industrial chemicals *d*	.....	.....	$1,378	$2,246	$1,434	$2,561
Payrolls (U. S. Dept. of Labor, 3 year av., 1923-25 = 100)						
Chemicals and allied prod., including petroleum	.....	.....	114.2	136.8	114.8	173.4
Other than petroleum	.....	.....	107.7	134.9	108.0	135.7
Chemicals	.....	.....	116.3	153.9	117.2	153.5
Explosives	.....	.....	92.4	103.8	89.3	103.0
Employment (U. S. Dept. of Labor, 3 year av., 1923-25 = 100)						
Chemicals and allied prod., including petroleum	.....	.....	104.1	124.3	103.9	123.9
Other than petroleum	.....	.....	100.6	123.5	100.6	123.4
Chemicals	.....	.....	107.7	139.5	107.7	138.5
Explosives	.....	.....	85.2	95.3	84.9	94.8
Stocks of chemicals, etc.**						
Finished	.....	143	.....	141	.....	141
Raw material	.....	81	.....	73	.....	74
Price index chemicals	.....	.....	81.7	89.9	80.6	90.1
Chem. and drugs	.....	.....	74.8	78.2	71.9	83.6
Fert. mat.	.....	.....	66.9	71.3	69.5	70.5

INDUSTRIAL TRENDS


MONTHLY AVERAGES
NEW YORK TIMES WEEKLY BUSINESS INDEX
Adjusted for Seasonal Variation
ESTIMATED NORMAL=100
1929 1930 1931 1932 1933 1934 1935 1936 1937 1938

Business: The past few weeks have been particularly trying chiefly, of course, because of the foreign crisis. But it is highly encouraging and quite significant that with Europe in the most "jittery" state of mind since 1914 and on the brink of another world war for days that business activity in this country held up remarkably well. Further, the immediate favorable reaction following the Munich pact was of sizable proportions and augurs well for the commercial trend over the balance of '38. Even the major disaster in the New England states failed to do more than cripple that section for a few days while it strove to repair the water and wind damage. According to the Board of Governors of the Federal Reserve System, industrial output during September was at the highest point in 11 months.

Steel: Output late in September was reported at 47% of capacity. Failure of certain of the automobile companies to get under way faster in the output of '39 models has held down expansion. Rapid increases are expected to bring the rate up to 60%.

Automobiles: The Detroit automobile schedule calls for an output of about 250,000 units in October. By the 15th of this month both Ford and Chevrolet are expected to be under way and by Nov. 1 the industry expects to be at the peak of production. A gain of about 25% to 30% in '39 is expected over the current year's total.

Retail Trade: New England suffered its worst disaster in years when a 5-day rain storm was followed by a hur-

State of Chemical Trade
Current Statistics (September 30, 1938)—p. 19

State of Chemical Trade

Current Statistics (September 30, 1938)—p. 20

ricane and a tidal wave. Retail trade suffered badly in that area, but in the rest of the country buying was brisk.

Wholesale Trade: Some hesitation was quite evident during the prolonged European crisis, but with this happily out of the way, at least for the immediate future, purchasing in a liberal manner was again reported. Buying on Christmas lines is specially heavy.

Employment: Dept. of Labor reports a rise of 320,000 in August with a wage gain of $12,000,000. The National Industrial Conference Board reports August employed at 43,453,000, a gain of 422,000 workers, or about a 1% increase over July. Rise in employment is expected to exceed 1,500,000 this autumn. The current recovery pace is above the movement in the last half of '35.

Textiles: All lines continue to show healthy gains. Rayon demand, which broke all existing records in July and August, is continuing to expand at a favorable rate. September silk consumption of 38,844 bales was the best total since April, '37, despite the N. Y. City trucking strike. Cotton and wool are showing satisfactory expansion.

Glass: Output continues to improve, but August production totals for plate glass, window glass, and glass containers still indicate that the industry is well behind the corresponding totals for '37.

Construction: Fall building outlook is very bright.

Paper: Production of paper other than newsprint and paperboard in August reached a stage which indicates that the volume will soon exceed that which prevailed a year ago. Reason for the lag in newsprint is that publishers have been working off abnormally large surpluses.

Carloadings: Carloadings' rise is likely to persist until late October. Delayed grain shipments and trade upturn are expected to prolong traffic gains. September weekly figures were influenced by the upset conditions in New England.

Commodity Prices: First decline in nearly two months was reported Sept. 24 by the *Annalist* weekly wholesale price index.

Outlook: It is difficult to exaggerate the relief here and abroad at the almost unbelievable escape from a world holocaust. Belief is almost universal that we are approaching a period of good business and no one will minimize the psychological effect of such feeling. The outlook is indeed bright and contrasts with the pessimistic frame of mind the entire country was in at this period last year.

MONTHLY STATISTICS (cont'd)

	August 1938	August 1937	July 1938	July 1937	June 1938	June 1937
FERTILIZER:						
Exports (short tons, Nat. Fert. Association)						
Fertilizer and fert. materials ..	.....	169,349	.....	168,654	99,717	120,301
Ammonium sulfate	.....	9,498	.....	10,138	1,131	4,003
Total phosphate rock	.....	127,555	.....	126,240	82,876	80,357
Total potash fertilizers	.....	6,251	.....	15,009	2,070	19,193
Imports (short tons, Nat. Fert. Association)						
Fertilizer and fert. materials ..	.....	129,877	.....	90,686	86,484	119,153
Ammonium sulfate	.....	7,146	.....	11,068	8,682	6,320
Sodium nitrate	.....	2,089	.....	3,098	55,063	52,578
Total potash fertilizer	.....	77,385	.....	32,581	6,403	9,646
Superphosphate e (Nat. Fert. Association)						
Production, bulk	.....	314,814	166,641	242,651	227,223	286,685
Shipments, total	.....	172,361	131,557	169,264	410,067	482,824
Northern area	.....	101,718	79,814	88,447	262,122	312,329
Southern area	.....	70,643	51,743	80,817	147,945	170,495
Stocks, end of month, total ...	.....	.....	1,238,660	1,094,702	1,158,054	932,764
Tag Sales (short tons, Nat. Fert. Association)						
Total, 17 states	127,901	162,219	75,932	62,677	117,078	115,827
Total, 12 southern	44,005	40,245	59,232	52,776	116,361	114,802
Total, 5 midwest	83,896	121,974	16,700	9,901	717	1,025
Fertilizer payrolls	.....	.....	63.0	77.1	66.3	79.2
Fertilizer employment	.....	.....	57.1	69.8	62.3	75.7
Value imports, fert. and mat. *d*	.....	.....	$1,351	$2,002	$1,885	$2,616
GENERAL:						
Acceptances outst'd'g *f*.....	$258	$343	$265	$352	$264	$364
Coal prod., anthracite, tons	2,774,000	2,903,000	2,571,000	2,748,000	3,868,567	4,040,363
Coal prod., bituminous, tons ...	28,280,000	33,988,000	23,460,000	31,990,000	22,850,000	31,776,000
Com. paper outst'd'g *f*	$209	$329	$211	$325	$225	$284
Failures, Dun & Bradstreet	974	707	995	618	1,018	670
Factory payrolls *i*	76.4	103.8	67.5	100.4	67.2	102.9
Factory employment *i*	81.3	102.3	76.4	101.4	75.9	101.4
Merchandise imports *i*	$165,540	$245,668	$140,836	$265,214	$145,898	$286,224
Merchandise exports *i*	$230,621	$277,031	$227,780	$268,184	$232,686	$265,341
GENERAL MANUFACTURING:						
Automotive production	90,484	394,330	141,437	438,968	174,667	497,312
Boot and shoe prod., pairs ...	41,643,916	38,661,489	30,415,556	34,842,000	26,676,651	34,449,040
Bldg. contracts, Dodge *j*	$313,141	$281,217	$239,799	$321,603	$251,006	$317,742
Newsprint prod., U. S., tons ..	67,436	80,311	86,256	78,205	.....	78,500
Newsprint prod., Canada, tons	220,303	318,713	202,546	316,194	201,546	310,871
Plate glass prod., sq. ft.	7,676,078	17,898,064	5,505,768	15,344,555	5,956,386	19,392,254
Steel ingot prod., tons	2,546,988	4,877,826	1,982,058	4,556,304	1,638,277	4,184,223
% steel capacity	42.85	83.33	33.42	78.48	28.46	74.48
Pig iron prod., tons	1,493,995	3,605,818	1,201,785	3,498,858	1,062,021	2,107,506
U. S. consumpt. crude rub., tons	38,170	41,456	32,209	43,650	30,629	51,860
Cotton consumpt., bales.....	.....	.....	449,511	583,011	442,742	680,521
Cotton spindles oper.	22,152,526	24,341,192	21,916,166	24,394,300	21,143,988	24,558,398
Silk deliveries, bales	38,504	.....	32,593	31,399	31,492	.....
Rayon ship., index *p*	895	693	843	697	473	693
Rayon employment *i*	.....	.....	289.8	401.0	284.2	391.4
Rayon payrolls *i*	.....	.....	266.1	392.9	258.1	391.8
Soap employment *i*	.....	.....	93.4	102.4	91.7	102.5
Soap payrolls *i*	.....	.....	109.0	116.9	107.1	115.1
Paper and pulp employment *i* ..	.....	.....	104.2	119.5	104.5	120.5
Paper and pulp payrolls *i*	.....	.....	98.3	119.2	96.4	124.3
Leather employment	.....	.....	75.6	94.7	73.9	98.0
Leather payrolls *i*	.....	.....	79.3	104.0	76.1	108.4
Glass employment *i*	.....	.....	74.2	107.9	79.5	112.4
Glass payrolls *i*	.....	.....	68.5	108.6	77.1	119.4
Rubber prod. employment *i* ..	.....	.....	68.1	96.2	70.6	101.2
Rubber prod. payrolls *i*	.....	.....	62.6	96.8	63.2	103.8
Dyeing and fin. employment *i* ..	.....	.....	96.8	109.1	97.8	109.7
Dyeing and fin. payrolls *i*	.....	.....	78.9	94.1	76.7	95.8
MISCELLANEOUS:						
Oils & Fats Index ('26 = 100)..	60.6	78.8	63.9	84.6	60.2	85.6
Gasoline prod., bbls.	.....	.....	48,913	48,216	45,718	47,273
Cottonseed oil consumpt., bbls.	326,723	315,152	332,986	.....	.....	.....
PAINT, VARNISH, LACQUER, FILLERS:						
Sales 680 establishments	.....	$35,305,043	$27,946,084	$36,004,636	$33,936,706	$41,656,085
Trade sales (580 establishments)	.....	$18,521,006	$16,368,159	$18,502,323	$20,167,900	$22,348,182
Industrial sales, total	.....	$13,517,878	$8,806,128	$14,186,572	$9,763,856	$15,343,359

a Bureau of Mines; *b* Crude and refined plus motor benzol, Bureau of Mines; *c* Based on 1 lb. of gun cotton to 7 lbs. of solvent, making an 8-lb. jelly; *d* 000 omitted, Bureau of Foreign & Domestic Commerce; *e* Expressed in equivalent tons of 16% A.P.A.; *f* 000,000 omitted at end of month; *i* U. S. Dept. of Labor, 3 year average, 1923-25 = 100; *j* 000 omitted, 37 states; *p* Rayon Organon, 1923-25 = 100; *q* 680 establishments, Bureau of the Census; *r* Classified sales, 580 establishments, Bureau of the Census; *s* 53 manufacturers, Bureau of the Census; *v* In thousands of bbls., Bureau of the Census; ** Indices, Survey of Current Business, U. S. Dept. of Commerce.

Price Trend of Representative Chemical Company Stocks

	Aug. 31	Sept. 3	Sept. 10	Sept. 17	Sept. 24	Sept. 30	Net gain or loss last mo.	Price on Sept. 30, 1937	1937 High	1937 Low
Air Reduction ..	60¾	62	58	56⅛	55	59½	—1¼	65	65¾	40
Allied Chemical	173¼	180	176½	174	174	183	+9¾	196	184	124
Am. Cyan'd "B"	22¼	23	23½	...	21⅜	24½	+2¼	28¼	26⅝	15½
Am. Agric. Chem.	...	...	78	74	72	78k	...	77	84¾	49
Colum. Carbon ..	90	89	85	83	85	88	—2	100	98½	53¾
Com'l Solvents ..	10	10⅝	9¾	8½	8¾	10	...	10⅞	12¼	5⅞
Dow Chemical ..	129	131	129¾	127¼	125	127	—2	111½	140⅛	87⅞
Du Pont 1	305⅝	136	129½	129	129	134½	+2⅞	144½	135¾	90½
Hercules Powder	62½	63	60	57¾	57	62	— ½	128¼	65¼	42¾
Mathieson Alkali ...		28½	27⅜	26¼	27⅜	28	...	27½	30½	19¾
Monsanto Chem.	...	95	95½	93¼	93½	95½	...	93	99⅛	67
Std. of N. J. ..	52¼	54	51¾	50¾	49½	53¼	+1	...	58⅜	39¾
Tex. Gulf Sulph..	35	36¾	35¼	34⅞	35¼	37⅜	+2⅜	33	37¾	26
Union Carbide ..	81⅝	84½	81⅝	78	79	84¼	+2⅝	89	87	57
U. S. Ind. Alco.	21¾	21½	20½	19	19⅛	21	— ¾	26⅛	24¼	13½

k Price as of Oct. 1.

Earnings Statements Summarized

Company:	Annual dividends	Net income 1938	Net income 1937	Common share earnings 1938	Common share earnings 1937	Surplus after dividends 1938	Surplus after dividends 1937
Archer-Daniels-Midland:							
Year, June 30	y$1.50	$437,737	$2,967,295	$.43	$5.03	.....	.....
Clorox Chemical:							
Year, June 30	3.00	329,059	359,141	3.00	3.28	.....	.....
Illinois Zinc:							
June 30 quarter	f ..	†66,935	69,222	....	....	.....	.....
Nine months, June 30...	f...	†187,899	134,830	....	....	.....	.....
International Agricultural:							
Year, June 30	f...	701,328	770,154	.003	.16	.....	.....
McKesson & Robbins:							
**June 30 quarter	....	530,448	770,581	.06	.29	.....	.....
Six months, June 30 ...	....	1,018,995	1,750,272	.09	.74	.....	.....
Reynolds Metals:							
July 2 quarter..	e.40	148,165	580,678	h.08	h.53	.....	.....
Six months, July 2....	e.40	305,768	1,123,636	h.16	h1.02	.....	.....
United Dyewood:							
Six months, June 30.....	e.75	†73,896	234,672	...	.94	d175,991	27,172
U. S. Smelting, Refining & Mining:							
v Eight months, Aug. 31	y7.00	2,364,086	4,485,890	2.41	6.41	.....	.....
United Wall Paper Factories, Inc.:							
Year, June 30	y.10	137,885	275,438	.08	.20	d17,924	31,225
Valspar Corp.:							
Twelve months, Aug. 31..	f...	79,997	310,467	....	....	.....	.....

y Amount paid or payable in 12 months to and including the payable date of the most recent dividend announcement; f, no common dividend; † net loss; ** indicated quarterly earnings as shown by comparison of company's reports for quarters.

T. G. S. Reports 49c

Texas Gulf Sulphur reports for quarter ended June 30, net profit of $1,875,443 after depreciation, amortization, contingencies, federal income taxes, etc., equivalent to 49c a share on 3,840,000 no-par shares of capital stock.

This compares with $3,777,398 or 98c a share in the June quarter of previous year and $1,839,687 or 48c a share in the quarter ended March 31, '38.

For 6 months ended June 30, indicated net profit (as compiled from company's quarterly reports) was $3,715,130 equal to 97c a share, comparing with $5,877,448 or $1.53 a share in first half of '37.

Net profit for 12 months ended June 30, '38, was $9,426,963 equal to $2.45 a share, against $10,919,455 or $2.84 a share for the 12 months ended June 30, '37.

Hercules' 6 Months' Report

Hercules Powder reports for the first 6 months of '38 net earnings of $1,227,134, after providing for depreciation and Federal taxes. This is equal, after payment of preferred dividends, to 73c a share on an average of 1,316,710 shares of common stock outstanding during the period. Figures for the first half of '37 showed net earnings of $3,037,012, equal, after payment of preferred dividends, to $4.70 a common share on an average of 590,722 shares then outstanding.

Current assets, as shown at the end of the half year, amount to $20,738,251. This represents an 11.3 ratio to current liabilities. Cash and marketable securities amount to $9,623,114. Dividends of 65c a share were paid on the common stock during the period.

Cyanamid's 6 Months' Net Profit

Report of American Cyanamid and subsidiaries for 6 months ended June 30, subject to audit and year-end adjustments, shows net profit of $524,649 after depreciation, depletion, research and process development expenses, interest, amortization, federal income taxes, minority interest, etc., equivalent after dividends of $34,066 on preferred stock, to 19c a share on 2,520,368 shares (par $10) of combined Class A and Class B common stocks outstanding at close of period, excluding shares held by subsidiaries. This compares with $2,844,325, or $1.13 a share on combined common shares in first half of 1937.

Net profit does not include company's equity in undistributed net income of certain affiliated companies in which the company does not have a majority interest.

Dividends and Dates

Name	Div.	Stock Record	Payable
Abbott Labs. q.	40c	Sept. 14	Sept. 30
Abbott Labs., pfd., q.	$1.12½	Oct. 1	Oct. 15
Air Reduction, e	25c	Sept. 30	Oct. 15
Air Reduction, q.	25c	Sept. 30	Oct. 15
Am. Agr. Chem.	$1.00	Sept. 20	Sept. 30
Am. Cyanamid A & B, q.	15c	Sept. 15	Oct. 1
Am. Cyanamid, pfd., q.	12½c	Sept. 15	Oct. 1
Am. Hard Rubber, pfd., q.	$2.00	Sept. 16	Sept. 30
Am. Maize Prods.	25c	Sept. 20	Sept. 30
Am. Maize Prods., pfd., q.	$1.75	Sept. 20	Sept. 30
Am. Smelt. & Ref.	50c	Nov. 4	Nov. 30
Am. Smelt. & Ref., pfd., q.	$1.75	Oct. 7	Oct. 31
Atlantic Refining, pfd., q.	$1.00	Oct. 4	Nov. 1
Bon Ami Cl. A., q.	$1.00	Oct. 15	Oct. 31
Bon Ami Cl. B., q.	62½c	Oct. 15	Oct. 31
Canadian Ind. A & B	$1.25	Sept. 30	Oct. 31
Celanese of Am., 7% pt. pfd.	$2.00	Sept. 16	Oct. 1
Celanese of Am., 7% pr. pfd., q.	$1.75	Sept. 16	Oct. 1
Climax Molybdenum	30c	Sept. 23	Sept. 30
Clorox Chemical, q.	75c	Sept. 15	Sept. 25
Colgate-Palm-Peet, pfd., q.	$1.50	Sept. 6	Oct. 1
Compressed Ind. Gases	(no action May 4, '38)		
Devoe & Raynolds Cl. A.	25c	Sept. 24	Oct. 1
Devoe & Raynolds Cl. B.	25c	Sept. 24	Oct. 1
Dom. Tar & Chem., pfd., q.	$1.37½	Oct. 12	Nov. 1
du Pont, pfd., q.	$1.12½	Oct. 10	Oct. 25
du Pont, deb., q.	$1.50	Oct. 10	Oct. 25
Eagle Picher Lead, pfd., q.	$1.50	Sept. 20	Oct. 1
Flintkote Co.	(no action June 1, '38)		
General Printing Ink, q.	10c	Sept. 20	Oct. 1
General Printing Ink, pfd., q.	$1.50	Sept. 20	Oct. 1
Gulf Oil	25c	Sept. 15	Oct. 1
Hercules Powder	25c	Sept. 13	Sept. 24
Int'l Nickel	50c	Aug. 31	Sept. 30
Int'l Nickel, pfd., q.	$1.75	Oct. 4	Nov. 1
Int'l Salt, q.	37½c	Sept. 15	Oct. 1
Koppers Co., 6% pfd.	75c	Sept. 16	Oct. 1
Liquid Carbonic Sp-year	25c	Sept. 19	Sept. 26
Mathieson Alkali, q.	37½c	Sept. 7	Sept. 30
Mathieson Alkali, pfd., q.	$1.75	Sept. 7	Sept. 30
Merck & Co., pfd., q.	$1.50	Sept. 23	Oct. 1
Merck & Co.	(action deferred June 14, '38)		
Monroe Chemical, pfd., q.	87½c	Sept. 15	Oct. 1
Nat. Lead Co.	12½c	Sept. 16	Sept. 30
Nat. Lead, Cl. B., pfd., q.	$1.50	Oct. 14	Nov. 1
Nat. Gypsum, 1st pfd., q.	$1.75	Sept. 15	Oct. 1
Nat. Gypsum, 2nd pfd., q.	$1.50	Oct. 14	Nov. 1
Paraffine Cos.	50c	Sept. 10	Sept. 27
Paraffine Cos., pfd., q.	$1.00	Oct. 1	Oct. 15
Pratt & Lambert	25c	Sept. 15	Oct. 1
Procter & Gamble, 8% pfd., q.	$2.00	Sept. 23	Oct. 15
Pure Oil, 5% pfd., q.	$1.25	Sept. 9	Oct. 1
Pure Oil, 5¼% pfd., q.	$1.25	Sept. 9	Oct. 1
Pure Oil, 6% pfd., q.	$1.50	Sept. 9	Oct. 1
Shell Union Oil, pfd., q.	$1.37½	Sept. 20	Oct. 1
Sherwin-Williams Can., pfd., q.	$1.37½	Sept. 20	Oct. 1
Skelly Oil, pfd., q.	$1.50	Oct. 4	Nov. 1
Std. Wholesale Phos. & Acid, q.	20c	Sept. 30	Oct. 15
Texas Corp., q.	50c	Sept. 9	Oct. 1
Union Carbide	40c	Sept. 2	Oct. 1

e—Extra.
Sp-year—Special year-end.

Chemical Finances
September 1938—p. 19

Chemical Finances

September 1938—p. 20

Chemical Stocks and Bonds

PRICE RANGE Sept. 1938 Last	High	Low	1937 High	Low	1936 High	Low	Sales	Stocks	Par $	Shares Listed	Dividends*	Earnings** $-per-share-$ 1937	1936	1935
							Number of shares Sept. 1938	1938						
NEW YORK STOCK EXCHANGE														
53	53½	36¼	55	36	...	...	2,700	20,700	Abbott Labs.	No	640,000	$2.10	2.51	2.21	1.77
59½	65¾	40	80¼	44½	86½	58	24,900	270,100	Air Reduction	No	2,566,191	3.00	2.86	2.79	2.05
183	184	124	258½	145	345	157	7,700	130,600	Allied Chem. & Dye	No	2,214,099	7.50	11.19	11.44	8.71
75	84¾	49	101½	53½	89	49	1,300	27,200	Amer. Agric. Chem	No	210,932	7.75	8.86	4.71	6.37
11⅜	14¾	9	30¾	8¼	35⅜	20½	6,400	82,300	Amer. Com. Alcohol	No	260,930	.50	3.23	4.55	3.16
27	31½	20	46	22	50	37	2,100	17,100	Archer-Dan.-Midland	No	549,546	2.00	5.03	3.05	4.20
54	58	36	94	38	84	48	1,700	21,100	Atlas Powder Co.	No	248,145	2.25	4.40	4.21	2.81
117	119	105	133	101	131	112	20	1,970	5% conv. cum. pfd.	100	68,597	5.00	20.90	20.85	16.93
21⅝	25¾	9	41¼	13	32¼	21¾	85,500	554,600	Celanese Corp. Amer.	No	1,000,000	2.25	2.04	2.33	1.99
87	96	82	115	90	116	106	300	2,950	prior pfd.	100	164,818	7.00	27.07	27.25	35.34
12	13¾	7⅛	25¾	8½	21¼	13	29,500	321,000	Colgate-Palm.-Peet	No	1,999,970	.50	—.35	1.40	1.36
98½	98½	78	104½	95	106½	100	2,600	14,600	6% pfd.	100	248,197	6.00	3.21	17.13	16.79
88	98½	53¼	125¼	65	136½	94	1,800	41,400	Columbian Carbon	No	537,406	6.50	8.31	7.48	5.56
10	12¼	5⅞	21¼	5	24⅝	14¼	48,800	612,800	Commercial Solvents	No	2,636,878	.60	.60	.85	1.02
65⅝	70⅝	53	71¼	50½	82½	63⅜	11,500	143,100	Corn Products	25	2,530,000	3.00	2.52	3.86	2.62
170½	170½	162	171½	153	170	158	300	3,900	7% cum. pfd.	100	245,738	7.00	32.96	46.76	33.97
33⅜	39¼	25	76⅛	29½	63	42	1,720	18,620	Devoe & Rayn. A	No	95,000	3.25	4.05	4.49	2.89
127	140⅛	87⅞	159¼	79½	142¼	94⅛	3,000	59,100	Dow Chemical	No	945,000	3.35	4.17	4.48	3.29
134½	135¾	90½	180⅛	98	184¾	133	35,500	625,700	DuPont de Nemours	20	11,041,437	6.25	7.37	7.54	5.04
117	118⅝	109½	112	107½	...	...	1,400	11,800	4½% pfd.	No	500,000	4.50	165.48	...	...
135	137	130¾	135½	130	136½	129	1,200	24,700	6% cum. deb.	100	1,092,948	6.00	81.70	84.21	56.81
174	181	121½	198	144	185	156	8,200	118,900	Eastman Kodak	No	2,250,921	7.50	9.76	8.23	6.90
174	181	121½	164	150	166	152	90	1,950	6% cum.	100	61,657	6.00	362.45	306.64	258.09
30½	32	19⅞	32¼	18	35⅝	23¼	20,200	179,900	Freeport Texas	10	796,380	1.50	3.30	2.43	1.78
9¼	12⅛	6¾	19	8½	18	9½	3,800	92,500	Gen. Printing Ink	1	735,960	1.20	1.32	1.32	.97
22¼	27¼	13	51½	19⅛	55¼	39½	11,800	146,000	Glidden Co.	No	799,701	2.60	2.62	3.29	2.74
43½	51½	37	58⅛	43	56	52¼	100	5,400	4½% cum. pfd.	50	199,940	2.25	12.72	15.43	13.23
92½	98	76¾	117½	80⅛	133	99⅝	400	9,500	Hazel Atlas	25	434,474	6.56	6.67	6.55	7.58
62	65¼	42¾	92½	50	75	42	5,000	115,100	Hercules Powder	No	1,316,710	2.62	2.97	3.24	2.12
134	134½	126¾	135½	125	135	126	200	2,700	6% cum. pfd.	100	96,194	6.00	50.75	48.97	36.30
27	30⅜	14⅜	47½	15	41⅜	25⅝	14,400	183,300	Industrial Rayon	No	759,325	2.00	.34	2.24	1.00
21	26½	15	64¼	20	48	37	5,300	50,300	Interchem.	No	289,058	2.00	1.44	3.02	2.21
81	98	80	111½	92	112	107	310	2,010	6% pfd.	100	66,917	6.00	12.26	18.97	16.15
2⅝	3⅞	2	9⅛	2	5⅞	2⅞	5,900	86,800	Intern. Agricul.	No	438,048		.16	—1.55	—.99
21¼	29	15	63½	18¼	47¼	22¾	1,500	24,800	7% cum. pfd.	100	100,000	3.00	7.70	.23	2.69
50½	52¾	36⅞	73⅜	37	66⅜	43¼	156,600	1,888,600	Intern. Nickel	No	14,584,025	2.25	3.31	2.40	1.65
23⅛	26	19½	28¾	19½	30	23	700	11,200	Intern. Salt	No	240,000	1.75	2.17	1.70	1.32
22	24	19¾	36	19¼	36¾	29¼	1,100	8,800	Kellogg (Spencer)	No	500,000	1.60	2.81	2.62	2.22
52	54⅝	23¼	79	33⅝	80¼	47½	37,400	283,800	Libbey Owens Ford	No	2,506,117	4.00	4.19	4.14	3.26
18	21½	12⅛	26⅞	14	46½	32½	6,600	86,800	Liquid Carbonic	No	700,000	2.75	2.37	1.58	1.29
28	30½	19¾	41¾	22	42⅜	27½	4,200	51,700	Mathieson Alkali	No	828,191	1.65	1.81	1.76	1.44
95½	99⅛	67	107½	71	103	79	10,900	148,700	Monsanto Chem.	No	1,114,388	3.00	4.40	4.01	3.45
117½	117½	111	109	105	...	...	430	11,730	4½% pfd.	No	50,000	4.50	99.98	...	...
24⅞	31	17⅛	44	18	36½	26¾	33,800	421,200	National Lead	10	3,098,310	.50	.95	1.71	1.08
165	167	154	171	153	171	155	300	3,300	7% cum. "A" pfd.	100	243,676	7.00	22.86	33.83	25.40
141⅝	145½	127	150	127	147	137¾	360	2,470	6% cum. "B" pfd.	100	103,277	6.00	43.77	74.50	49.05
15¾	19½	9⅞	41¾	10⅛	40	9	38,300	674,000	Newport Industries	1	519,347	.50	2.22	.98	.57
69¼	74⅛	40	103¾	51¼	82	64	18,800	231,300	Owens-Illinois Glass	12.50	2,661,204	4.00	3.51	3.80	2.09
54¼	57½	39½	65½	43¼	56	40¼	17,400	159,000	Procter & Gamble	No	6,325,087	2.75	4.08	2.39	2.23
116½	122¼	115	118½	114½	122½	115¾	930	7,960	5% pfd.	100	169,517	5.00	157.05	94.14	88.15
15¾	18⅜	10	34¾	14⅞	28¼	14¾	16,600	185,200	Shell Union Oil	No	13,070,625	1.00	1.44	1.35	.37
104½	105¾	93	105⅜	91	127½	102	1,900	19,500	5½% cum. pfd.	100	379,798	5.00	60.59	57.20	17.92
24¼	34¾	18½	60⅝	26½	47⅜	19½	12,000	139,400	Skelly Oil	No	1,006,348	1.50	6.07	4.42	2.17
90	93	84	102¼	88	132	97⅝	900	3,900	6% cum. pfd.	100	66,300	6.00	97.86	73.16	39.00
29⅜	35½	24¾	50	26½	48½	32¾	45,400	417,400	S. O. Indiana	25	15,235,323	2.30	3.06	3.09	1.98
53¼	58⅜	39¾	76	42	70⅜	51⅛	89,300	957,500	S. O. New Jersey	25	26,224,767	2.50	5.64	3.73	2.39
6¼	8	3⅞	15⅜	5¼	13	5⅝	6,600	111,500	Tenn. Corp.	5	853,696	.35	1.09	.41	.22
44⅛	49⅝	32⅝	65⅛	34¾	55¼	28⅞	83,900	967,000	Texas Corp.	25	11,386,253	2.25	5.02	4.10	1.57
37⅜	37¾	26	44	23¾	44¾	33	23,200	278,400	Texas Gulf Sulphur	No	3,840,000	2.75	3.02	2.57	1.94
84¼	87	57	111	61¾	105¼	71⅝	55,000	721,300	Union Carbide & Carbon	No	9,000,743	3.20	4.75	4.09	3.06
59¾	65½	39	91	36¾	96¾	68	5,300	82,400	United Carbon	No	397,885	4.50	5.30	5.54	4.71
21	24¼	13½	43⅝	16⅛	59	31¼	9,000	107,900	U. S. Indus. Alcohol	No	391,238		1.24	—.20	2.16
18¾	21⅜	11½	39⅜	9¼	30⅝	16¼	18,300	240,900	Vanadium Corp. Amer.	No	376,637	1.00	2.22	.40	—1.13
15	18½	13½	...	...	...	...	1,400	15,200	Victor Chem.	5	696,000	1.12	1.01	1.16	1.13
4	5⅝	2¾	12¾	2⅜	8½	4⅛	8,200	146,000	Virginia-Caro. Chem.	No	486,708		—.05	—2.44	—.79
24½	32⅛	15¾	74⅜	18½	58¾	28¾	9,000	118,300	6% cum. part. pfd.	100	213,392	1.50	5.88	.44	4.20
15	20⅛	10	27¼	10¾	32	19¾	900	24,100	Westvaco Chlorine	No	339,362	1.00	1.46	1.17	1.37
27½	30¼	20	34⅞	21⅜	35¼	31¾	900	16,000	cum. pfd.	30	192,000	1.50	4.09	3.26	3.22
NEW YORK CURB EXCHANGE															
24½	26⅝	15½	37	17⅝	40¾	29¼	32,300	348,000	Amer. Cyanamid "B"	10	2,520,368	.60	2.09	1.77	1.61
73¼	83½	50	124	69	116½	99¼	975	4,050	Celanese, 7% cum. 1st pfd.	100	148,179	7.00	22.32	24.47	21.96
3	4½	3	15	3	16½	9	700	8,200	Celluloid Corp.	15	194,952		—.92	—.80	—.95
6⅞	12	6⅞	14⅝	10½	15	11⅞	200	1,100	Courtaulds' Ltd.	£1	24,000,000	9½%	8.64%	8.30%	7.51%
7¼	9⅞	6	10⅝	3½	10¾	5	1,000	14,700	Duval Texas Sulphur	No	500,000		.43	.61	.16
35	37½	27	47½	31	55	39	200	4,400	Heyden Chem. Corp.	100	150,000	2.50	3.94	3.56	3.22
104½	106¾	55	147½	77	140	98¼	7,900	81,000	Pittsburgh Plate Glass	25	2,142,443	6.50	8.53	7.15	5.32
105½	115	66	154¾	72¼	154½	117	4,050	56,900	Sherwin Williams	25	633,927	6.00	8.44	8.04	6.19
112	114⅛	107	114	106¼	116	110	260	1,950	5% cum. pfd.	100	137,139	5.00	44.01	41.44	33.17
PHILADELPHIA STOCK EXCHANGE															
155¼	160	121½	179	115	179	114¾	200	3,275	Pennsylvania Salt	50	150,000	8.75	11.79	8.57	5.94

PRICE RANGE Sept. 1938 Last	High	Low	1937 High	Low	1936 High	Low	Sales	Bonds	Date Due	Int. %	Int. Period	Outstanding $
NEW YORK STOCK EXCHANGE							Sept. 1938	1938				
102¾	105⅜	99⅛	109½	99	117½	107¾	300,000	2,434,000	Amer. I. G. Chem. Conv.	1949	5½ M-N	$25,300,000
33½	37½	25⅛	42½	23	42½	27½	54,000	1,527,000	Anglo Chilean Nitrate inc. deb	1967	4½-5 J	12,067,000
105½	106	102⅜	102⅞	100⅛	...	...	21,000	472,000	Dow Chemical	1951	3 J-D	5,000,000
102	102¾	100	102	98½	102¾	96¾	10,000	187,000	Int. Agric. Corp. 1st Coll. tr. stpd. to 1942	1942	5 M-N	5,633,000
33¼	34	24¼	35⅜	21¼	39	21	79,000	1,545,000	Lautaro Nitrate n inc. deb.	1975	4 J-D	30,500,000
23	23	20½	25½	20½	35	23½	...	23,000	Rohr Chem.	1948	6 A-D	1,500,000
103½	104¾	96½	102	93	101¼	94¼	390,000	4,002,000	Shell Union Oil	1951	3½ M-S	58,800,000
103⅛	103½	90¼	102¾	94	102⅞	96⅝	124,000	1,649,000	Skelly Oil	1951	4 J-J	9,000,000
101	102½	95	105	93½	105	103	9,000	196,000	Tenn. Corp. deb. "B"	1944	6 M-S	1,600,000
106	107¾	103½	105¾	100	106	101½	322,000	2,959,000	Texas Corp.	1951	3½ J-D	60,000,000
93	99½	77	111	81	98½	85¾	18,000	435,000	Vanadium Corp. conv.	1941	5 A-O	2,800,000

* Paid in 1937, including extras but excluding dividends paid in stock. ** For either fiscal or calendar years.

U. S. Chemical Patents

Off. Gaz.—Vol. 493, Nos. 1, 2, 3, 4, 5—p. 51

Agricultural Chemicals

Plant food containing fish meal. No. 2,127,629. Linus H. Jones, Amherst, Mass., to W. Bartlett Jones, Chicago, Ill.

Devitalizing composition for combatting pests of the insect class, containing as its essential active ingredient a-aceto-benzo-tetronic acid. No. 2,127,879. Henry Martin to J. R. Geigy S.A., both of Basel, Switzerland.

Extraction nicotine from tobacco; treating tobacco with liquid anhydrous ammonia and liquid butane. No. 2,128,043. James B. Garner, Mount Lebanon, Pa., to Hope Natural Gas Co., corp. of West Virginia.

Spray insecticide comprising a volatile material capable of dissolving fats, waxes, etc., and liquid at ordinary temperature and pressure, together with a normally gaseous material comprising a hydrocarbon having a boiling point below minus 20°C. No. 2,128,433. Erik Rotheim, Oslo, Norway.

Cellulose

Electric conductor and filaments therefor containing organic derivative of cellulose. No. 2,126,850. William Whitehead, Cumberland, Md., to Celanese Corp. of America, corp. of Del.

Method reducing corrosive properties of cellulose acetate, by treatment with an aqueous solution containing an organic base. No. 2,126,851. William Whitehead, Cumberland, Md., to Celanese Corp. of America, corp. of Del.

Method xanthating cellulose; admixing carbon bisulfide with cellulose and caustic soda solution in contact with a liquid ketone miscible with the carbon bisulfide and caustic soda solution. No. 2,126,975. George A. Richter to Brown Co., both of Berlin, N. H.

Process involving formation of viscose by admixture of cellulose, caustic soda solution, and liquid carbon bisulfide. No. 2,126,976. George A. Richter and Everett W. Lovering to Brown Co., all of Berlin, N. H.

Stabilization simple and mixed cellulose esters which have been prepared by esterifying cellulose in presence of at least one sulfuric acid radical containing catalyst. No. 2,127,789. Otto Sindl, Paris, France, and Georg Frank, Moedling, near Vienna, Austria, to "Afag" Finanzierungs A. G., Schaffhausen, Switzerland.

Removal tackiness of freshly spun yarn bodies of hydrated viscose cellulose; treating same prior to first drying with an aqueous emulsion of a substance of the group of fats and oils. No. 2,127,984. Walter Ostermann, Wuppertal-Barmen, Germany, to American Bemberg Corp., New York City.

Treatment cellulosic materials and resulting products. No. 2,128,229. William Hale Charch, Buffalo, N. Y., and Dorothy Bateman Maney, Old Hickory, Tenn., to du Pont, Wilmington, Del.

Manufacture cellulosic cords. No. 2,128,302. Morris Katz, Bronx, N. Y.

Chemical Specialty

Prevention deterioration of oxide coated aluminum leather-drying boards; interposing between leather and oxide-coated surface a substance capable of reacting with the acid of the tanning liquor from the leather, maintaining a pH at the surface of the oxide coating of at least 4.5. No. 2,126,712. James R. Akers, New Kensington, Pa., to Aluminum Co. of America, Pittsburgh, Pa.

Self-heating pad, comprising a single ply of aluminum foil and a single ply of absorbent paper with margins folded to form a container, latter containing composition of following: chlorate of potassium, aluminum dust, anhydrous sulfate of copper, kaolin, pumice. No. 2,126,734. Ernest C. Chancey, Detroit, Mich.

Preparation stiffened laminated fabrics, such as collars, etc.; first impregnating same with dispersion of finely divided thermoplastic cellulose derivative in a non-solvent. No. 2,126,753. Camille Dreyfus, New York City.

Production stiffened fabrics, uniting fabrics of non-thermoplastic material to one another with aid of heat and pressure by means of an intermediate layer of fabric of cellulose acetate yarns containing finely divided titanium dioxide. No. 2,126,754. Camille Dreyfus, New York City, and George Schneider, Montclair, N. J., to Celanese Corp. of America, corp. of Del.

Production stiffened collars and cuffs, etc., using non thermoplastic fabric and second fabric containing a thermoplastic derivative of cellulose and plasticizer, union being effected in presence of water. No. 2,126,755. Camille Dreyfus, New York City.

Preparation fabric for use in manufacture of collars, cuffs, etc., stiffened by application of heat and pressure by incorporating a finely divided or powdered water-insoluble derivative of cellulose in intimate mixture with a cellulose ether. No. 2,126,756. Camille Dreyfus, New York City.

Fabrics comprising plurality of fabrics containing both non-thermoplastic fibres and thermoplastic cellulose derivative yarns or filaments, possessing increased stiffness. No. 2,126,758. Camille Dreyfus, New York City.

Method imparting stiffness or other properties to a fabric containing thermoplastic derivative of cellulose. No. 2,126,759. Camille Dreyfus, New York City.

Method imparting stiffness to collars, cuffs, etc., containing yarns or filaments of an organic derivative of cellulose. Nos. 2,126,820-1-2-3-4. George Schneider, Montclair, N. J., to Celanese Corp. of America, corp. of Del.

Production stiffened fabrics having wrinkle-proof properties. No. 2,126,830. Arthur Bruce Snowdon, Hillsdale, N. J., and Henry R. Bodell, Ossining, N. Y., to Celanese Corp. of America, corp. of Del.

Demulsifying agent for breaking emulsions of water in petroleum oil, comprising a sulfonated hydrocarbon polymer soap, prepared from polymers obtained by treatment of light cracked petroleum distillates with solid, polymerizing, adsorbent catalyst at elevated temperatures. No. 2,126,839. James G. Suthard, to Pure Oil Co., both of Chicago, Ill.

Production of a dry, friable insecticidal product from derris and similar insecticidal-containing vegetable sources; using a volatile chlorinated solvent and a member of the group of anhydrous alkali metal carbonates and anhydrous alkali earth metal carbonates in process. No. 2,126,854. Robert Wotherspoon, East Orange, N. J., to Derris, Inc., New York City.

Dilute liquid textile finishing material consisting of a solution of a solvent for sucrose acetate and a sucrose acetate together with a softening agent for latter. No. 2,126,936. Eugene Wolgamuth Wall to Kali Mfg. Co., both of Phila., Pa.

Horticultural spray composition; mixture of a hydrocarbon oil and an oil soluble reaction product of an unsaturated fatty oil and thiodiphenylamine. No. 2,127,039. Frank F. Lindstaedt, Oakland, Calif.

Production tanning agents by condensing the sulfonic acid of a monohydric phenolic body of the benzene series in the sulfonation mass itself with formaldehyde in presence of urea. No. 2,127,068. Paul Muller, Neu-Allschwill, near Basel, Switzerland, to J. R. Geigy A. G., Basel, Switzerland.

Insecticide having as its essential active ingredient 4,6-dinitro-o-tolyl acetate. No. 2,127,090. Lloyd E. Smith, Washington, D. C.

Cleaning and pickling metals; subjecting metals to action of a non-oxidizing acid which contains a resin. No. 2,127,147. John V. Vaughen, Lakewood, Ohio, to du Pont, Wilmington, Del.

Rust inhibiting composition for treating metal preparatory to painting; including sodium chloride, chromic acid, and cresylic acid. No. 2,127,202. Clete L. Boyle, Detroit, Mich.

Tanning hides and pelts by treatment with a tanning agent comprising an iron compound and a polycarboxylic substance. No. 2,127,297. Eugen Immendoerfer and Hermann Loewe, Ludwigshafen-on-the-Rhine, and Herbert Muench, Mannheim, Germany, to I. G., Frankfort-on-the-Main, Germany.

Composition of matter containing a water-soluble colloidal substance, a resin, a solvent for latter, an alkali, and aluminum stearate. No. 2,127,298. Mone R. Isaacs, Phila., Pa.

Process tanning with water-soluble zirconium compounds; applying to hide or skin in any stage of the tanning process an aqueous solution of a water-soluble silicic acid compound. No. 2,127,304. Gustav Mauthe and Hermann Noerr, Leverkusen-I. G. Werk, Germany, to I. G., Frankfort-on-the-Main, Germany.

Shade cloth having fabric base containing zinc oxide and a cellulose nitrate composition coating; coating consisting of cellulose nitrate, pigment, plasticizer, ethyl acetate and ethyl alcohol. No. 2,127,320. Cornelius A. Alt, Newburgh, N. Y., to du Pont, Wilmington, Del.

Insecticide and fungicide comprising complex products of reactions between a solution of an alkali metal arsenite, an inorganic cupric salt, and alkali metal salts. No. 2,127,380. Frederick E. Dearborn, Washington, D. C., dedicated to free use of people of the U. S.

Hardening and waterproofing composition for concrete or mortar; mix comprising hydraulic cement, aggregate, a finely divided non-hydraulic filling material and finely divided waste sulfite liquor residue. No. 2,127,451. Edward W. Scripture, Jr., Shaker Heights, Ohio, to Master Builders Co., Cleveland, Ohio.

Production quaternary ammonium bases; causing ethylene oxide to act in presence of water on a water-insoluble tertiary amine containing two low molecular aliphatic radicles and an open chain aliphatic radicle containing at least 8 carbon atoms. No. 2,127,476. Heinrich Ulrich and Ernst Ploetz, Ludwigshafen-on-the-Rhine, Germany, to I. G., Frankfort-on-the-Main, Germany.

Anti-foaming and anti-freezing solution, adapted to minimize foaming of aqueous solutions, comprising water, glycerin, Montan wax, and lard oil. No. 2,127,490. Marcellus T. Flaxman, Wilmington, Calif., to Union Oil Co. of Calif., Los Angeles, Calif.

Foam controlling composition; composed of a refined non-volatile mineral oil, Montan wax foam suppressing base material, and oil-soluble soap of metal. No. 2,127,491. Marcellus T. Flaxman, Wilmington, Calif., to Union Oil Co. of Calif., Los Angeles, Calif.

Lubricating grease containing a soda-type soap, aluminum stearate, and lubricating oil. No. 2,127,497. Frederick Arthur Webster, Jr., Richmond, Calif., to Standard Oil Co. of Calif., San Francisco, Calif.

Fungicide or insecticide composition containing a bland vegetable or animal oil, an oil-soluble insect poison, a hydrocarbon distillate, and an oil-soluble emulsifying agent. No. 2,127,526. Walter C. O'Kane, Durham, N. H.

Production cores and molds; mixing rubber in divided particles, with component material of such articles. No. 2,127,533. Charles Marshall Saeger, Jr., Bowmanstown, Pa.

Production molds and cores; forming article and applying coating of a rubber substance to surface. No. 2,127,534. Charles Marshall Saeger, Jr., Bowmanstown, Pa.

Core binder; molding or core sand containing balata as binder. No. 2,137,535. Charles Marshall Saeger, Jr., Bowmanstown, Pa.

A thermoplastic adhesive having an appreciable initial tack, a predetermined temperature of solidification, and an appreciable heat of fusion; mixture of acetamide and an amorphous colloid. No. 2,127,540. Franklin S. Smith, New Haven, Conn.

Treatment of a zinc ammonium chloride galvanizing flux which contains sulfates and hence is unsatisfactory by reason of the poor foam produced when it is used with foaming agents; treating same with a soluble barium compound. No. 2,127,564. Raymond J. Kepfer, Lakewood, Ohio, to du Pont, Wilmington, Del.

Manufacture a sensitive photographic emulsion; precipitating a silver halide in an aqueous solution of a water-soluble cellulose compound. No. 2,127,573. Samuel E. Sheppard and Robert C. Houck, Rochester, N. Y., to Eastman Kodak Co., Jersey City, N. J.

Photographic emulsion having a silver halide dispersed in a water soluble cellulose ester. No. 2,127,621. Cyril J. Staud and Joseph L. Connelly, Rochester, N. Y., to Eastman Kodak Co., Jersey City, N. J.

Printing paste having as a non-adhesive, non-alkaline thickener, a polar hydrophile alcohol containing at least 8 carbon atoms insoluble in water, and a solution of an emulsifying water soluble hydrophile salt of an aliphatic sulfo acid containing at least 8 carbon atoms in the sulfatic nucleus in water. No. 2,127,770. Erhart Franz, Leipzig, and Max Hardtmann, Naunhof, near Leipzig, Germany.

Washable wall covering composed of pigment, glue, glacial acetic acid, sodium acetate, aluminum sulfate, and water. No. 2,127,818. George W. Jennings, Chicago, Ill.

Textile treating agents consisting of the alkaline condensation products of water soluble higher molecular products of simple hydrolysis of albuminous amino groups with a replaceable hydrogen atom. No. 2,127,841. Walter Gellendien to Deutsche Hydrierwerke Aktiengesellschaft, both of Berlin-Charlottenburg, Germany.

Method improving a casein solution characterized by its stability and undiminished viscosity over long periods of time; subjecting same to action of sodium perborate, to produce an improved color. No. 2,127,843. Carl Iddings, Staten Island, N. Y., to Muralo Co., corp. of New York.

Process for improving flux and resistance to distortion under heat of amine-formaldehyde condensation products, obtained by reacting a primary aromatic amine with more than an equimolecular proportion of formaldehyde yielding compound in presence of a mineral acid. No. 2,127,894. Theodor Sutter, Basel, Switzerland, to Ciba Products Corp., Dover, Del.

Formation an economic reacted plaster; tumbling a mixture of CaO and

U. S. Chemical Patents
Off. Gaz.—Vol. 493, Nos. 1, 2, 3, 4, 5—p. 51

U. S. Chemical Patents

Off. Gaz.—Vol. 493, Nos. 1, 2, 3, 4, 5—p. 52

gypsum during propagation of an inter reaction. No. 2,127,952. Parker C. Choate, Essex, Mass.

In relief or letterpress printing; supplying moisture to material to be printed, spraying printing ink of an oil or grease base with water in finely divided form just prior to time ink is applied to printing face. No. 2,127,955. Philip A. Frazier, Oak Park, Ill.

Improved lubricating oil of low pour point; comprising a waxy hydrocarbon oil and a polymer condensation product of a waxy hydrocarbon and an ether containing at least one cyclic hydrocarbon radical. No. 2,128,109. Peter J. Wiezevich, Elizabeth, N. J., to Standard Oil Development Co., corp. of Del.

Stable, alkaline oxygen-yielding washing powder; an alkali metal percarbonate, sodium carbonate and soap. No. 2,128,113. Karl Bauer, Frankfort-on-the-Main, and Friedrich Pressel and Hans Medweth, Rheinfelden-Baden, Germany, to Deutsche Gold und Silber Scheideanstalt vormals Roessler, Frankfort-on-the-Main, Germany.

Mothproofing woolen fabrics and other materials by treatment with mono-phenyl-di-(ortho-xenyl)-phosphate. No. 2,128,189. Lindley E. Mills and William W. Allen, to Dow Chemical Co., all of Midland, Mich.

Ornamental roofing material having an asphalt-saturated felt base and layer of exposed hydrocarbon oil-treated mineral granules; in final step applying a colorless, water-soluble fugitive coating on the weather exposed surfaces only of the granules. No. 2,128,191. Frank P. Reynolds, to Bird & Sons, Inc., both of East Walpole, Mass.

Manufacture a dense ceramic dielectric material, in particular adapted for electric condensers. No. 2,128,289. William Dubilier and Josef Oppenheimer, New York City.

In an oil filter, a solid and self-sustaining filtering element composed of mineral wool and a binder comprising a cold water paste; binder and wool being intermixed. No. 2,128,290. Albra H. Fessler, Flint, Mich., to General Motors Corp., Detroit, Mich.

Flameproofing composition; composed of a water-repellent material, an inert substance carrying chlorine, and a heat fusible substance. No. 2,128,392. Charles M. Albion, Boston, Mass., to Herbert B. Morse, Wellesley, Mass.

Mold composition made from sand, and a non-swelling clay of which montmorillonite is a constituent. No. 2,128,404. Norman J. Dunbeck, to Eastern Clay Products, both of Eifort, Ohio.

Coal Tar Chemicals

Production polycyclic aromatic aldehydes and carboxylic acids; causing ozonized oxygen to act on an aromatic compound containing at least 4 condensed nuclei in presence of a liquid inert diluent and decomposing the ozonide thus obtained. No. 2,127,096. Heinrich Vollmann, Frankfort-on-the-Main-Hochst, and Hans Becker, Hofheim in Taunus, Germany, to General Aniline Works, Inc., New York City.

Distillation of gas liquor containing tar acids. No. 2,127,503. Fred Denig, Pittsburgh, Pa., to Koppers Co., corp. of Del.

Preparation 4,4'-dialkoxy diphenylamines. No. 2,128,100. Arthur M. Neal to du Pont, both of Wilmington, Del.

Manufacture and application of carbazole derivatives. No. 2,128,101. Wilfred Archibald Sexton, Blackley, Manchester, England, to Imperial Chemical Industries, corp. of Great Britain.

Preparation chlorinated primary anthraquinone compounds; carrying out chlorination in sulfuric acid. No. 2,128,178. William Dettwyler, Milwaukee, Wis., to du Pont, Wilmington, Del.

Preparation an amino-nitro-cyclohexyl-phenol, wherein the amino and nitro groups are attached to the benzene ring. No. 2,128,195. Frank B. Smith to Dow Chemical Co., both of Midland, Mich.

Manufacture amino derivatives of anthraquinone. No. 2,128,307. Geoffrey Lord and George Reeves, Spondon, near Derby, England, to Celanese Corp. of America, corp. of Del.

Coatings

Application monogram to a base material of non-thermoplastic material. No. 2,126,757. Camille Dreyfus, New York City.

Method stabilizing an oxide coating on an aluminum surface, by anodic oxidation in a sulfuric acid electrolyte without modifying appearance of coating, using a phosphate solution having a pH of about 3 to 8. No. 2,126,954. Junius D. Edwards, Oakmont, Pa., to Aluminum Co. of America, Pittsburgh, Pa.

Production protective coating on an oxidizable metal; treating metal surface with solution comprising a soluble permanganate, a soluble barium compound, and a soluble hydroxid. No. 2,127,206. Leo P. Curtin, Cranbury, N. J., to Curtin-Howe Corp., New York City.

Coating ferrous metal articles with films adapted to bond paints and varnishes thereto. No. 2,127,207. Leo P. Curtin, Cranbury, N. J., to Curtin-Howe Corp., New York City.

Coated all-metal gasket; coating consisting of digested elaterite. No. 2,127,372. John H. Victor, Wilmette, and Benjamin J. Victor, Oak Park, Ill., to Victor Mfg. & Gasket Co., Chicago, Ill.

Production elastic products from polyvinyl alcohols. No. 2,127,896. Herbert Vohrer, Berlin, Germany.

Coating composition composed of an ester of an aliphatic polyhydric nitro-alcohol with a mono-basic organic acid and a solid film-forming material. No. 2,128,136. Walter E. Gloor, Parlin, N. J., to Hercules Powder Co., Wilmington, Del.

Production coated sheet roofing material having a desired surface effect. No. 2,128,214. Ralph W. B. Reade, Port Washington, N. Y., to United States Gypsum Co., Chicago, Ill.

Dyes, Stains, Etc.

Production water-insoluble azo dyes, being a mixture of isomeric compounds. No. 2,126,841. Alfred Thurm, Dessau in Anhalt, Germany, to General Aniline Works, Inc., New York City.

Preparation carbocyanine dyestuffs. No. 2,126,852. Paul Wolff and Adolf Sieglitz, Frankfort-on-the-Main, Germany, to Agfa Ansco Corp., Binghamton, N. Y.

Method printing a vat dyestuff on animal fibres and textiles. No. 2,126,964. Max Kerth, Bad Soden in Taunus, Germany, to General Aniline Works, New York City.

Preparation 2,6-dichloroanthraquinone by replacement of both sulfonic acid groups of a 2,6 anthraquinonedisulfonic acid compound. No. 2,127,098. Myron S. Whelen, Milwaukee, Wisc., to du Pont, Wilmington, Del.

Process dyeing artificial fibers or foils from water-insoluble organic cellulose derivatives containing polymeric acid resins. No. 2,127,236. Paul Schlack, Berlin-Treptow, Germany, to I. G., Frankfort-on-the-Main, Germany.

Production metallo polyazo dyes. No. 2,127,470. Werner Lange, Dessau-Ziebigk in Anhalt, Germany, to General Aniline Works, Inc., New York City.

Production water-insoluble azo dyestuffs. No. 2,127,471. Fritz Muller, Willy Schumacher, and Otto Scherer, Frankfort-on-the-Main, Germany, to General Aniline Works, Inc., New York City.

Production orange disazo dyes having formula $R_5—N=N—R_1—R_2—N=N—ROH$. No. 2,127,478. Moses L. Crossley, Plainfield, and Lincoln M. Shafer, Highland Park, N. J., to Calco Chem. Co., Bound Brook, N. J.

Manufacture azo dyestuffs containing copper in a complex form. No. 2,127,678. Detlef Delfs and Rudolf Knoche, Leverkusen I. G.-Werk, Germany, to General Aniline Works, New York City.

Production water-insoluble azo dyestuffs. No. 2,127,697. Heinrich Morschel, Leverkusen-Wiesdorf, Eugen Rimele, Leverkusen-I. G. Werk, and Felix Gund, Cologne, Germany, to General Aniline Works, New York City.

Production azo dyestuffs. No. 2,127,986. Hans Roos, Leverkusen-I. G.-Werk, Germany, to General Aniline Works, New York City.

Production polyazo dyestuffs. No. 2,128,153. Hans Schindhelm, Frankfort-on-the-Main-Fechenheim, and Carl Theo Schultis, Bergen, near Frankfort-on-the-Main, Germany, to General Aniline Works, New York City.

Production azo dyestuffs. No. 2,128,188. Adolf Krebser, Riehen, near Basel, Switzerland, to J. R. Geigy S.A., Basel, Switzerland.

Production azo dyestuffs. No. 2,128,255. Hans Krzikalla, Hans Ufer and Gustav Klaproth, Ludwigshafen-on-the-Rhine, and Bernd Eistert, Mannheim, Germany, to General Aniline Works, New York City.

Production azo dyestuffs. No. 2,128,256. Hans Krzikalla, Hans Ufer and Gustav Klaproth, Ludwigshafen-on-the-Rhine, and Bernd Eistert, Mannheim, Germany, to General Aniline Works, New York City.

Production copper-containing monoazo dyestuffs. No. 2,128,325. Francis Leslie Rose, Blackley, England, to Imperial Chemical Industries, corp. of Great Britain.

Explosives

Primary detonating composition made from sulfur nitride and an oxidizing agent. No. 2,127,106. Leroy R. Carl, Buffalo, N. Y.

Fine Chemicals

Developer for producing hardened images upon exposed silver halide-colloid emulsions. No. 2,126,899. Ferdinand Leiber, Berlin-Friedrichshafen, Germany, to Naamlooze Vennootschap: Nederlandsch Laboratorium de Spaarnestad, Haarlem, Netherlands, corp. of the Netherlands.

Photographic silver halide emulsion containing a supersensitizing combination of at least one sensitizing thiazolocarbocyanine dye with at least one sensitizing pseudocyanine dye. No. 2,127,340. Charles E. K. Mees to Eastman Kodak Co., both of Rochester, N. Y.

Preparation neutral, water-soluble complex compounds of trivalent antimony. No. 2,127,371. Hans Schmidt, Wuppertal-Vohwinkle, Germany, to Winthrop Chemical Co., New York City.

Production nitrogen base salts of acid alkyl esters. No. 2,127,495. Anton Johan Tulleners, Amsterdam, Netherlands, to Shell Development Co., San Francisco, Calif.

Purification caustic soda. No. 2,127,496. William F. Waldeck, Wadsworth, Ohio, to Pittsburgh Plate Glass Co., corp. of Pa.

Industrial Chemicals, etc.

Production hydrogen chloride. No. 2,126,803. Sidney G. Osborne to Hooker Electrochemical Co., both of New York City.

Recovery of products of fermentation. No. 2,126,974. Gustave T. Reich, Phila., Pa.

Preparation water-soluble reaction products of a primary alcohol and a tertiary aralkyl amine sulfuric acid salt. No. 2,127,103. Herman A. Bruson, Elkins Park, and Otto Stein, Lansdowne, Pa., to Rohm & Haas Co., Phila., Pa.

Manufacture dimethyl 6,12-coeroxenol acetate of high purity and yield; treating dimethyl 6,12-coeroxonol with pyridine, caustic alkali and zinc dust, and esterifying by addition of acetic anhydride. No. 2,127,107. Thomas A. Cassidy to Wilmot and Cassidy, Inc., both of Brooklyn, N. Y.

Production hydrocarbons from carbon monoxide and hydrogen. No. 2,127,127. Friedrich Martin, Oberhausen, and Otto Roelen and Walter Feisst, Oberhausen-Holten, Germany.

Manufacture dextrine from starch; first mixing a starch with a basically reacting ammonium compound. No. 2,127,205. John E. Clegg, Hempstead, and Frederick C. Hilliard, Setauket, N. Y., to Arabol Mfg. Co., New York City.

Removal acid from nitrated starch. No. 2,127,360. Johann Helle and Alfons Kunz, Fuzfo, Hungary, to Nitrokemia Ipartelepek Reszvenytarsasag, Budapest, Hungary.

Hydrogenation higher fatty acids. No. 2,127,367. Wilhelm Normann and Gustav von Schuckmann, to H. Th. Bohme Aktiengesellschaft, both of Chemnitz, Germany.

Production an iron compound of nitroso-beta-naphthol. No. 2,127,374. Edward R. Allen, Summit, N. J., and George Lutz, Rocky River, O., to du Pont, Wilmington, Del.

Preparation esters of dithiocarbamic acid; ester including at least 2 alkyl radicals at least one of which is a straight-chain radical of at least 8 carbon atoms. No. 2,127,375. Euclid W. Bousquet, to du Pont, both of Wilmington, Del.

Preparation polynuclear hydroaromatic amines. No. 2,127,377. Caryl Sly, to du Pont, both of Wilmington, Del.

Carrying out non-oxidizing catalytic reactions at elevated temperatures with combustible carbonaceous materials using as catalyst a sulfide of a heavy metal. No. 2,127,382. Mathias Pier, Heidelberg, and Paul Jacob and Walter Simon, Ludwigshafen-on-the-Rhine, Germany, to Standard-I. G., Co., Linden, N. J.

Destructive hydrogenation of carbonaceous materials at a temperature between 300 and 700°C., under superatmospheric pressure. No. 2,127,383. Mathias Pier, Heidelberg, and Paul Jacob and Walter Simon, Ludwigshafen-on-the-Rhine, Germany, to Standard-I.G. Co., Linden, N. J.

Manufacture thioindoxyl-anil. No. 2,127,483. Emeric Havas, Pitman, N. J., to du Pont, Wilmington, Del.

Preparation thioindoxyl derivative. No. 2,127,484. Emeric Havas, Pitman, N. J., to du Pont, Wilmington, Del.

U. S. Chemical Patents

Off. Gaz.—Vol. 493, Nos. 1, 2, 3, 4, 5—p. 53

Production basic aluminum nitrate. No. 2,127,504. Ralph B. Derr, Oakmont, and Henry B. Stere, New Kensington, Pa., to Aluminum Co. of America, Pittsburgh, Pa.

Preparation sulfated aliphatic compounds; reacting a fatty material with a derivative of isobutylene and treating product with fuming sulfuric acid. No. 2,127,567. Fred W. Muncie, New Brunswick, N. J., to Colgate-Palmolive-Peet Co., Jersey City, N. J.

Process for absorption of hydrochloric acid in liquids. No. 2,127,571. Fred W. Pardee, Jr., to du Pont, both of Wilmington, Del.

Production valuable hydrocarbon products by decomposition of distillable carbonaceous materials into lower molecular weight hydrocarbons, by heating in presence of catalysts. No. 2,127,577. Karl Winkler, Leuna, Germany, to I. G., Frankfort-on-the-Main, Germany.

Treatment lime containing combined fluorine to lower fluorine content; treating lime with a stream of inert gas enriched with added water vapor. No. 2,127,626. Louis Block to Blockson Chemical Co., both of Joliet, Ill.

Method chromium plating on a zinc base; etching base in a chromic acid-sulfate plating solution, then electrodepositing an adherent chromium coating on base. No. 2,127,640. Morris Brown, La Grange, and Arthur M. Wagner, Riverside, Ill., to Western Electric Co., New York City.

Method for obtaining high grade sulfuric acid esters from reaction mixtures produced by sulfonating oils, fats, their fatty acids or mixtures. No. 2,127,641. Konrad Cremer to Chemische Fabrik Stockhausen & Cie, both of Krefeld, Germany.

Preparation esters of 2-chloroallyl alcohol. No. 2,127,660. Gerald H. Coleman and Bartholdt C. Hadler to Dow Chemical Co., all of Midland, Mich.

Filter aid having decolorizing properties. No. 2,127,702. Richard W. Schmidt, Redondo Beach, Calif., to Evanston Co., Los Angeles, Calif.

Process hydrogenating free fatty acids without increasing amount of completely saturated fatty acids. No. 2,127,716. Otto Brucke, Hochspeyer, Germany, to American Lurgi Corp., New York City.

Manufacture a double silicate of zirconium. No. 2,127,844. Charles J. Kinzie, Niagara Falls, N. Y., to Titanium Alloy Mfg. Co., New York City.

Manufacture porous bodies; using clay, combustible granules, and water in process. No. 2,127,867. Allen M. Harvey, Olean, N. Y.

Production variegated colored oxide coatings on aluminous metal surfaces; impregnating surface with a dye solution, decolorizing portion of surface by treatment with a solution of nitric acid, subsequently impregnating surface with another dye solution. No. 2,127,885. Ralph E. Pettit to Aluminum Colors, Inc., both of Indianapolis, Ind.

Storage stable, aqueous emulsions of saponifiable waxes free from black dyestuffs. No. 2,128,025. Karl Behringer, Mannheim, Germany, to I. G., Frankfort-on-the-Main, Germany.

Recovery sulfur dioxide from gas mixtures. No. 2,128,027. Arthur Maurice Clark, Norton-on-Tees, England, to Imperial Chemical Industries, corp. of Great Britain.

Addition agent to molten metal; mixture of iron, chromium powder, a deoxidizing material, and copper powder. No. 2,128,089. Franz R. Hensel and Earl I. Larsen, Indianapolis, Ind., to Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Acid resistant spinning bucket made from an acid resistant asbestos. No. 2,128,097. Gerald H. Mains, Murrysville, Pa., to Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Conversion metal sulfides. No. 2,128,107. Daniel Tyrer, Norton-on-Tees, England, to Imperial Chemical Industries, corp. of Great Britain.

Manufacture sulfuric acid by contact process. No. 2,128,108. Daniel Tyrer and Arthur Maurice Clark, Norton-on-Tees, England, to Imperial Chemical Industries, corp. of Great Britain.

Polymerization of gaseous olefines in which cadmium dihydrogen orthophosphate is used as the catalyst. No. 2,128,126. Albert Ernest Dunstan, to Anglo-Iranian Oil Co., Limited, both of London, England.

Purification tetraphosphoric acid containing pyrophosphoric acid as an impurity. No. 2,128,182. Augustus H. Fiske, Warren, R. I., to Rumford Chem. Works, Rumford, R. I.

Naval Stores

Polymerization of rosin without decreasing its acidity, treating same with a compound of boron trifluoride and molecular compounds of the latter. No. 2,124,675. Alfred L. Rummelsburg to Hercules Powder Co., both of Wilmington, Del.

Paper and Pulp

Pulp bleaching method, using free chlorine. No. 2,127,765. Ferri Casciani to Niagara Alkali Co., both of Niagara Falls, N. Y.

Flameproof water-and moisture-resistant paper, having its fibres impregnated with a flameproofing compound containing ammonium sulfate, a network of glycerinated gelatin; and a waterproofing rubber coating on paper. No. 2,128,296. Virginia Baker Goodwin and William H. Pashley, New York City.

Petroleum Chemicals

Method cracking hydrocarbon oils. No. 2,123,960. Henry C. Pennrich, Brussels, Belgium.

Removal suspended solids from oil. No. 2,124,148. Donald B. Nutt, El Segundo, Calif., to Standard Oil Co. of Calif., San Francisco, Calif.

Treatment cracked hydrocarbon distillates, to stabilize same against gum formation. No. 2,124,171. Leroy G. Story, Beacon, N. Y., to Texas Co., New York City.

Stabilization crude oil. No. 2,124,514. Richard J. Dearborn, Summit, N. J., to Texas Co., New York City.

Process dewaxing paraffinous oils; admixing to paraffinous wax-bearing oil a polymerized liquid SO_2-soluble mineral extract. No. 2,124,531. Franz Rudolf Moser, Amsterdam, Netherlands, to Shell Development Co., San Francisco, Calif.

Production aromatic hydrocarbons from aliphatic hydrocarbons of from 6 to 12 carbon atoms. Nos. 2,125,566-7. Aristid V. Grosse to Universal Oil Products Co., both of Chicago, Ill.

Production aromatic hydrocarbons from aliphatic hydrocarbons of from 6 to 12 carbon atoms. No. 2,124,583. Jacque C. Morrell to Universal Oil Products Co., both of Chicago, Ill.

Production aromatic hydrocarbons from aliphatic hydrocarbons of from 6 to 12 carbon atoms. No. 2,124,584. Jacque C. Morrell and Aristid V. Grosse to Universal Oil Prods. Co., all of Chicago, Ill.

Conversion of hydrocarbons. No. 2,124,585. Jacque C. Morrell to Universal Oil Prods. Co., both of Chicago, Ill.

Production aromatic hydrocarbons from aliphatic hydrocarbons of from 6 to 12 carbon atoms. No. 2,124,586. Jacque C. Morrell and Aristid V. Grosse to Universal Oil Prods. Co., all of Chicago, Ill.

Improved lubricating oil comprising a hydrocarbon oil and an added organic compound containing sulfur and halogen. No. 2,124,598. Luther B. Turner, Elizabeth, N. J., to Standard Oil Development Co., corp. of Del.

Refining hydrocarbon oils, bringing a liquid hydrocarbon oil into contact with a selective solvent for non-paraffinic hydrocarbons in presence of an auxiliary solvent. No. 2,124,606. Johannes Arnoldus Buchel and Reyerus Nicolaas Jan Saal, Amsterdam, Netherlands, to Shell Development Co., San Francisco, Calif.

Treatment hydrocarbon oil; pyrolytically cracking heavy hydrocarbon oil to produce incondensable gases and cycle stock. No. 2,125,234. Harold V. Atwell, White Plains, N. Y., to Gasoline Prods. Co., Newark, N. J.

Production motor fuel from cracked hydrocarbon vapors. No. 2,125,235. Harold V. Atwell, White Plains, N. Y., to Process Management Co., New York City.

Separation mixture containing solid wax and hydrocarbon oil to obtain an oil-free wax. No. 2,125,314. Oscar L. Roberts, Merwood Park, Pa., to Atlantic Refining Co., Phila., Pa.

Treatment oil well in a calcareous formation with aqueous hydrochloric acid. No. 2,125,429. Frank A. Denker, Hobbs, N. Mex., to Dow Chem. Co., Midland, Mich.

Clear liquid fuel of stable character, obtained by mixing following substances together: triethanolamine, oleic acid, butyl cellosolve, secondary hexyl alcohol, water, and gasoline. No. 2,125,448. Joseph W. Johnson, Salem, Hugo Van Roosten, Newton Center, Alexis E. Ushakoff, Beverly, and John J. Brophy, Salem, Mass.

Conversion hydrocarbon oils. No. 2,125,535. Charles H. Angell to Universal Oil Prods. Co., both of Chicago, Ill.

Conversion hydrocarbon oils. No. 2,125,564. Jacob Benjamin Heid to Universal Oil Prods. Co., both of Chicago, Ill.

Stabilization gasoline, involving use of an inhibitor. No. 2,125,636. William W. Holland, Baltimore, Md., to Petroleum Conversion Corp., New York City.

Production high octane rating motor fuel. No. 2,125,734. Percy A. Maschwitz, to Pure Oil Co., both of Chicago, Ill.

Manufacture anti-knock gasoline. No. 2,125,855. Luis de Florez, Pomfret, Conn., to Texas Co., New York City.

Method for dewaxng oils. No. 20,822. Reissue. Earle W. Gard, Palos Verdes Estates, Calif., to Union Oil Co. of Calif., Los Angeles, Calif.

Method raising cetene number of a high speed diesel engine fuel oil; using a halogenated hydrocarbon and an aromatic hydrocarbon in process. No. 2,125,875. Daniel P. Barnard, IV, Hammond, Ind., to Standard Oil Co., Chicago, Ill.

Production gasoline from petroleum. No. 2,125,921. Charles B. Hillhouse to Sylvia Remsen Hillhouse, both of New York City.

Color stable, viscous hydrocarbon oil. No. 2,125,961. Bernard H. Shoemaker and Clarence M. Loane, Hammond, Ind., to Standard Oil Co., Chicago, Ill.

Production valuable polymers from olefine mixtures. No. 2,126,001. Stewart C. Fulton, Elizabeth, N. J., and Thomas Cross, Jr., Baton Rouge, La., to Standard Oil Development Co., corp. of Del.

Process using hydrogenated solvents for dewaxing oils. No. 2,126,055. John V. Starr, Cranford, N. J., to Standard Oil Development Co., corp. of Del.

Conversion hydrocarbon oils. No. 2,126,204. Jacque C. Morrell to Universal Oil Prods. Co., both of Chicago, Ill.

Pyrolytic conversion hydrocarbon oils. No. 2,126,229. Kenneth Swartwood, to Universal Oil Prods. Co., both of Chicago, Ill.

Manufacture gasoline from still gases. No. 2,126,281. James R. Rose, Edgeworth, Pa., three-fourths to Michael L. Benedum and Joseph C. Trees, Pittsburgh, Pa.

Manufacture catalyst suitable for production gasoline from still gases, using phosphate rock, kaolin, and phosphoric anhydride. No. 2,126,282. James R. Rose, Edgeworth, Pa., three fourths to Michael L. Benedum and Joseph C. Trees, both of Pittsburgh, Pa.

Manufacture gasoline or other liquid hydrocarbons; bringing still gases in contact with a catalyst consisting of carnotite and barium fluoride. No. 2,126,283. James R. Rose, Edgeworth, Pa., three-fourths to Michael L. Benedum and Joseph C. Trees, both of Pittsburgh, Pa.

Catalyst suitable for treatment refinery gases containing saturates and unsaturates, consisting of carnotite and barium fluoride. No. 2,126,284. James R. Rose, Edgeworth, Pa., three fourths to Michael L. Benedum and Joseph C. Trees, both of Pittsburgh, Pa.

Acid treatment of petroleum white oil stock; using sulfuric acid. No. 2,126,867. Nathaniel Brewer, Lansdowne, Pa., to Sharples Specialty Co., Phila., Pa.

Hydration of olefines, contacting an olefine with water vapor in presence of a catalyst comprising a salt of an acid character having a high affinity for water. No. 2,126,952. Henry Dreyfus, London, England.

Conversion hydrocarbon oils. No. 2,126,988. Alvin Engelstein to Universal Oil Products Co., both of Chicago, Ill.

Pyrolytic conversion of hydrocarbon oils. No. 2,126,989. Alvin Engelstein to Universal Oil Products Co., both of Chicago, Ill.

Production iso-octene from a hydrocarbon gas mixture containing isobutylene and other polymerizable gaseous olefins, subjecting mixture to action of a mono-metallic-ortho-phosphate. No. 2,127,001. Jacque C. Morrell to Universal Oil Products Co., both of Chicago, Ill.

Cracking hydrocarbons by contact with hot combustion gases. No. 2,127,009. Robert Pyzel to Universal Oil Products Co., both of Chicago, Ill.

Combined cracking, coking, and reforming process for conversion hydrocarbon oils. No. 2,127,011. Jean Delattre Seguy to Universal Oil Products Co., both of Chicago, Ill.

Conversion hydrocarbon charging oil containing residual portions of petroleum. No. 2,127,013. Kenneth Swartwood to Universal Oil Products Co., both of Chicago, Ill.

Conversion hydrocarbon oils. No. 2,127,014. Kenneth Swartwood and Charles H. Angell to Universal Oil Products Co., all of Chicago, Ill.

Breaking petroleum emulsions; subjecting latter to action of a reagent including a water soluble soap and cyclohexanol. No. 2,127,140. Harold Jay Robertson, Tulsa, Okla., to Sinclair Refining Co., New York City.

Process breaking petroleum emulsions; subjecting latter to action of a reagent including a water softening agent and a reaction product of ammonia and another compound. No. 2,127,141. Harold Jay Robertson, Tulsa, Okla., to Sinclair Refining Co., New York City.

Solvent refining of hydrocarbon oil. No. 2,127,325. Louis A. Clarke, Fishkill, N. Y., to Texas Co., New York City.

U. S. Chemical Patents
Off. Gaz.—Vol. 493, Nos. 1, 2, 3, 4, 5—p. 53

U. S. Chemical Patents

Off. Gaz.—Vol. 493, Nos. 1, 2, 3, 4, 5—p. 54

Method enhancing safety of liquid fuel during storage and use; cooling fuel to low temperatures, and dissolving in same a gas which does not form explosive mixtures with the vapors of the fuel. No. 2,127,536. Peter Schlumbohm to George Von Seebeck, both of New York City.

Treatment hydrocarbon distillates. No. 2,127,654. Reginald K. Stratford, Sarnia, Ont., Canada, to Standard Oil Development Co., corp. of Del.

Method treating well in a formation containing carbonate, introducing into well an initial quantity of an acid solution and a foam-producing agent. No. 2,127,662. John J. Grebe to Dow Chemical Co., both of Midland, Mich.

Petroleum hydrocarbon wax of high tensile strength; being admixture of paraffin and petroleum waxes. No. 2,127,668. Elmer Wade Adams, Hammond, Ind., and Frederick H. MacLaren, Calumet City, Ill., to Standard Oil Co., Chicago, Ill.

Process dewaxing a wax bearing petroleum lubricating oil. No. 2,127,708. Vanderveer Voorhees, Hammond, Ind., to Standard Oil Co., Chicago, Ill.

Production polymers suitable for lubrication, from fatty oils, by treating with a polymerization catalyst. No. 2,127,811. Egon Eichwald, Amsterdam, Netherlands, to Shell Development Co., San Francisco, Calif.

Breaking petroleum emulsions of the water-in-oil type. No. 2,127,905. Melvin De Groote, University City, Mo., to Tret-O-Lite Co., Webster Groves, Mo.

Method increasing anti-knock qualities of hydrocarbon motor fuels boiling within the gasoline range. No. 2,127,953. Harry E. Drennan, Whittenburg, Tex., to Phillips Petroleum Co., corp. of Del.

Solvent refining hydrocarbon oil. No. 2,128,029. Waldersee B. Hendrey, Beacon, N. Y., to Texas Co., New York City.

Production gum and color stable motor fuel containing cracked gasoline; adding para-aminophenol to a crude cracked hydrocarbon distillate. No. 2,128,075. Richard G. Clarkson, Wilmington, Del., and Claude G. Wolff, Penns Grove, N. J., to du Pont, Wilmington, Del.

Manufacture a transparent, petroleum-derived, water-soluble soap gel. No. 2,128,083. Carleton Ellis, Montclair, N. J., to Standard Oil Development Co., corp. of Del.

Self-lubricating molded bearing comprising a synthetic resin. No. 2,128,087. Thomas L. Gatke, Chicago, Ill.

Well treating fluid formed from an acid capable of forming water soluble salts with the earth formation, containing a protective colloid. No. 2,128,160. Leo Clark Morgan, Wichita, Kans.

Well treating fluid, composed of an acid capable of forming a water soluble salt with the earth formation, acid containing a calcium sequestering agent. No. 2,128,161. Leo Clark Morgan, Wichita, Kans.

Process bleaching oils. No. 20,838. Reissue. Benjamin Clayton, Houston, Tex., and Benjamin H. Thurman, Bronxville, N. Y., to Refining Inc., Reno, Nev.

Pigments, Dry Colors

Method transferring an aqueous pigment pulp to a pigment in oil. No. 2,126,925. Lonnie W. Ryan, Westfield, and Earl Knudt Fischer, Elizabeth, N. J., to Interchemical Corp., New York City.

Preparation hydrated oxide of iron suitable for pigments; immersing metallic iron in solution of an iron salt, then supplying a gas containing free oxygen to the solution. No. 2,127,907. Peter Fireman, Lambertville, N. J., to Magnetic Pigment Co., New York City.

Resins, Plastics, etc.

Production phenol-terpene resinous condensation products. No. 2,123,898. Herbert Honel, Vienna, and Alois Zinke, Graz, Austria, to Helmuth Reichhold, Detroit, Mich., doing business as Reichhold Chemicals.

Manufacture urea-aldehyde synthetic resins. No. 2,124,151. Henry S. Rothrock to du Pont, both of Wilmington, Del.

Flame-resistant, plastic composition, made from a solid chlorinated naphthalene, a higher chlorinated paraffin wax, and a flame retarding material. No. 2,124,288. Herbert Dodd, Broomhill, Glazebrook, near Manchester, England, to Imperial Chemical Industries, Ltd., corp. of Great Britain.

Production polyvinyl acetal resin plastic. No. 2,124,315. Joseph D. Ryan, to Libbey-Owens-Ford Glass Co., both of Toledo, Ohio.

Production moldable phenol-aldehyde resins. No. 2,124,532. Josef Schmitz, Wiesbaden, Germany, to Resinous Prods. & Chem. Co., Phila., Pa.

Plastic composition comprising a water-soluble cellulose ether and a xenyl phosphate. No. 2,124,540. Edgar C. Britton, Shailer L. Bass and Earl G. Hallonquist to Dow Chem Co., all of Midland, Mich.

Hot pressed objects consisting of urea aldehyde horn condensation products. No. 2,125,776. Carleton Ellis, Jr., Montclair, N. J., to Plaskon Co., corp. of Del.

Manufacture transparent plastic material: first softening and plumping mineral tanned leather scrap with an alkaline water solution, in final step adding a plasticizing agent and a water-proofing agent. No. 2,126,344. Willett C. Pierson, East Orange, N. J., to National Products Corp., Washington, D. C.

Manufacture of articles from cellulose plastic materials. No. 2,126,714. Bjorn Andersen, Maplewood, and Walter Dempsey Paist, Newark, N. J., to Celluloid Corp., corp. of N. J.

Manufacture compatible mixture of oil modified polyhydric alcohol-polybasic acid condensation product and a resin of the class of natural resins and urea-aldehyde resins. No. 2,126,773. Walther Heyn, Berlin, Germany, to du Pont, Wilmington, Del.

Resinous reaction product of a halide of an aromatic dicarboxylic acid and an ester of an aromatic hydroxy carboxylic acid, characterized by insolubility in alkaline solutions. No. 2,126,794. Walter R. Marshall, Bloomfield, N. J., to Bakelite Corp., New York City.

Production coal tar resins; mixing a naphtha containing compounds of the cumarone indene group with liquid hydrocarbons to form a solution, then adding a polymerizing agent. No. 2,126,937. John Morris Weiss, New York City, to Calorider Corp., Greenwich, Conn.

Preparation a terpene-maleic anhydride condensation product. No. 2,126,944. Wyly M. Billing, Kennett Square, Pa., to Hercules Powder Co., Wilmington Del.

Formation aqueous dispersions of vinyl esters; emulsifying the monomeric ester in water containing an emulsifying agent which has no chemical action on the products of polymerization, then subjecting emulsion to polymerizing influences. No. 2,127,135. Hermann Plauson, Hamburg, Germany, to Rohm & Haas Co., Phila., Pa.

Preparation resinous material; reacting polymerized lactic acid and at least one esterifying agent at temperature of at least 225°C. No. 2,127,248. George L. Dorough to du Pont, both of Wilmington, Del.

Process increasing hardness of polymerized vinyl compounds. No. 2,127,381. Willy O. Herrmann and Wolfram Haehnel, Munich, Germany, to Chemische Forschungsgesellschaft, m.b.H., Munich, Germany.

Plasticizer composition made from a polyvinyl halide and an organic sulfone. No. 2,127,400. Carlin F. Gibbs, Cuyahoga Falls, Ohio, to B. F. Goodrich Co., New York City.

Rubber

Non-tacky, sheeted raw rubber product, adapted to replace reclaimed rubber in manufacture of rubber articles: mixture of raw rubber and an oleaginous plasticizing agent. No. 2,124,774. Lucien Gaisman, Woodley, near Manchester, England.

Preservation latex containing free ammonia and hydroxylamine. No. 2,126,268. John McGavack, Leonia, N. J., to United States Rubber Prods., New York City.

Production vulcanized rubber product, incorporating in rubber a pyrimidine sulfide. No. 2,126,269. William E. Messer, Cheshire, Conn., to United States Rubber Prods., New York City.

Manufacture sponge rubber. Nos. 2,126,273-5. Stewart R. Ogilby, Staten Island, N. Y., to United States Rubber Prods., New York City.

Treatment latex; adding to same a buffer solution having a pH of approximately 7.0 and sterilizing by heat treatment. No. 2,126,831. David Spence, Monterey, Calif.

Improvement in rubber compounding; milling a pigment with a proteinaceous substance to produce dry, unagglomerated pigment particles coated with the proteinaceous substance, then adding said particles to a rubber compound. No. 2,127,560. George S. Haslam, Palmerton, Pa., to New Jersey Zinc Co., New York City.

Rubber composition including rubber and an improving agent. No. 2,128,127. Albert K. Epstein and Benjamin R. Harris, Chicago, Ill., to Colgate-Palmolive-Peet Co., Jersey City, N. J.

Production rubber coated fabrics. No. 2,128,312. Edward Arthur Murphy, Wylde Green, Birmingham, England, to Dunlop Rubber Co., London, England.

Textile, Rayon

Production and treatment artificial filaments, yarns, films, etc., containing cellulose derivatives, using a lower aliphatic compound containing chlorine atoms and oxygen in process. No. 2,123,934. William Alexander Dickie and Percy Frederick Combe Sowter, Spondon, near Derby, Eng., to Celanese Corp. of America, corp. of Del.

Production matt effects on artificial silk; fixing on fibre sulfate radicles in form of insoluble sulfates of organic bases containing a hydrocarbon radicle of at least 10 carbon atoms, rinsing material and treating it in bath containing a water-soluble barium compound. No. 2,123,986. Karl Brodersen and Matthias Quaedvlieg, Dessau in Anhalt, Germany, to I. G., Frankfort-on-the-Main, Germany.

Production matt effects on artificial silk; treating same with suspension of a pigment in a solution of water-soluble salt of a guanidine derivative. No. 2,123,987. Karl Brodersen and Matthias Quaedvlieg, Dessau in Anhalt, Albert Schneider, Leverkusen-Wiesdorf, and Herbert Gensel, Leverkusen I. G. Werk, Germany, to I. G., Frankfort-on-the-Main, Germany.

Method finishing textiles of mixed types of fibers. No. 2,125,925. Daniel H. Jones, Collingswood, N. J., to Celanese Corp. of America, corp. of Del.

Textile threads dressed with composition comprising unsubstituted naphthalenes and an oil. No. 2,126,000. Henry Hans Freund, Cliffside Park, N. J., to du Pont, Wilmington, Del.

Method treating fur; working a comminuted, soft, solid fibrous material through fur, said material being impregnated with a hide softening, a pest control, and glaze coating agents. No. 2,126,261. Jenny Jacobs, New York City.

Conditioning yarn to render it more amenable to textile operations; adding thereto a lubricating and softening composition having as its essential ingredient a keto-ether. No. 2,126,314. Joseph B. Dickey and James G. McNally, to Eastman Kodak Co., all of Rochester, N. Y.

Treatment cotton fibres containing natural waxes or gums; subjecting same to action of hot aqua ammonia to soften the gums or waxes. No. 2,126,809. William Beach Pratt, Wellesley Hills, Mass.

Production highly twisted crepe thread of artificial origin. No. 2,127,554. Henry Dreyfus, London, England.

Production pile fabric, pile consisting of organic derivative of cellulose yarns, of improved properties; coating, with a wax-like substance, at least part of the cellulose yarns in the pile. No. 2,127,586. Camille Dreyfus, New York City, and William Whitehead, Cumberland, Md., to Celanese Corp. of America, corp. of Del.

Production highly twisted crepe threads of improved characteristics. No. 2,127,624. William Whitehead, Cumberland, Md., to Celanese Corp. of America, corp. of Del.

Production permanent coating on a textile by immersing same in a solution of hexamethylene-tetramine, then subjecting wet fabric to action of an emulsion containing paraffin, an aluminum salt and gelatin. No. 2,127,650. Oscar F. Muller, Glen Ridge, N. J., to Nyanza Color & Chem. Co., New York City.

Silk and textile soaking process; immersing fabric in bath containing a soaking oil as a negatively charged disperse phase and a discharging agent adapted to gradually discharge the bath, latter agent consisting of an ammonium salt. No. 2,127,904. Dale S. Chamberlin, Bethlehem, Pa., to Warwick Chemical Co., West Warwick, R. I.

Water, Sewage Treatment

Removal fluorides from water, free from suspended matter, to render it potable; using suspended matter, orthophosphoric acid, and calcium hydroxide in process. No. 2,126,793. Walter H. MacIntire, Knoxville, Tenn.

Production softened water from hard water by aid of hydrogen zeolites capable of removing the bases of permanent hardness and with acid regeneration. No. 2,127,310. Ray Riley, Long Island City, N. Y., to Permutit Co., New York City.

Preparation water for industrial purposes of all kinds, especially boiler feed water. No. 2,127,450. Albert Schneider and Friedrich Gaisser, Stuttgart, Germany.